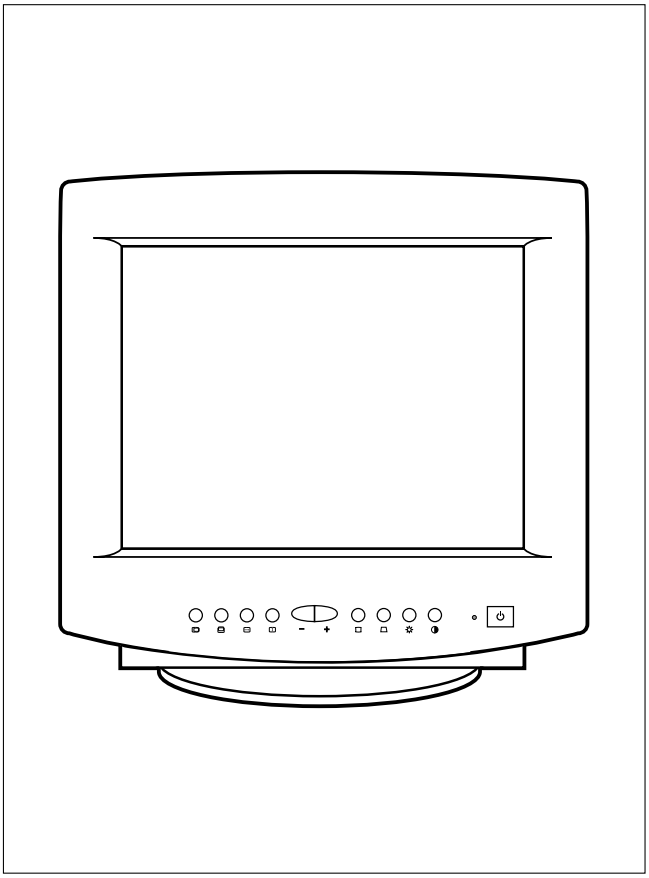
SAMSUNG

COLOR MONITOR

CKA4217L
CKA4227L
CKA5227L

SERVICE Manual

COLOR MONITOR



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1 Precautions

Follow these safety, servicing and ESD precautions to prevent damage and to protect against potential hazards such as electrical shock and X-rays.

1-1 Safety Precautions

1-1-1 Warnings

1. For continued safety, do not attempt to modify the circuit board.
2. Disconnect the AC power before servicing.
3. When the chassis is operating, semiconductor heatsinks are potential shock hazards.

1-1-2 Servicing the High Voltage System and CRT

WARNING: Empty or damaged E^2PROM may cause excessive x-ray emissions.

Caution: When replacing the E^2PROM, IC203 a high voltage step must be adjusted until high voltage becomes 24.5 kV. Standard dump from Softjig does this.

1. When servicing the high voltage system, remove the static charge by connecting a 10k ohm resistor in series with an insulated wire (such as a test probe) between the chassis and the anode lead. (Disconnect the AC line cord from the AC outlet.)
2. **High Voltage Adjustment**
   This monitor does not need to adjust high voltage, standard dump from Softjig automatically adjust the high voltage to 24.5kV.
3. It is essential that service technicians have an accurate high voltage meter available at all times. Check the calibration of this meter periodically.
4. When troubleshooting a monitor with excessively high voltage, avoid being unnecessarily close to the monitor. Do not operate the monitor for longer than is necessary to locate the cause of excessive voltage.
5. High voltage should always be kept at the rated value, no higher. Be sure all service personnel are aware of the procedures and instructions covering X-rays.

   The only potential source of X-ray in current solid state display monitors is the tube. However, the CRT does not emit measurable X-ray radiation if the high voltage is at the high voltage adjustment value.

   Only when high voltage is excessive are X-rays capable of penetrating the shell of the CRT, including the lead in glass material. Operation at high voltages may also cause failure of the CRT or high voltage circuitry.
6. When the high voltage regulator is operating properly, there is no possibility of an X-ray problem. Test the brightness and use a meter to monitor the high voltage each time a color monitor comes in for service. Make sure the high voltage does not exceed its specified value and that it is regulating correctly.
7. The CRT is especially designed to prohibit X-ray emissions. To ensure continued X-ray protection, replace the CRT with only one that is the same or equivalent type as the original. Carefully reinstall the CRT shields and mounting hardware; these also provide X-ray protection.
8. Handle the CRT only when wearing shatterproof goggles and after completely discharging the high voltage anode.
9. Do not lift the CRT by the neck.

1-1-3 Fire and Shock Hazard

Before returning the monitor to the user, perform the following safety checks:

1. Inspect each lead dress to make certain that the leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the monitor.
2. Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacitor networks, mechanical insulators, etc.

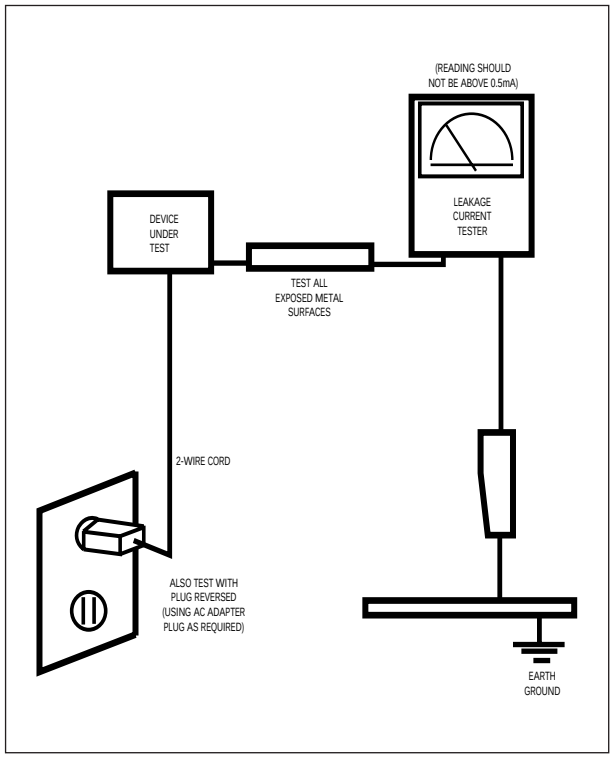


Figure1-1. Leakage Current Test Circuit

3. Leakage Current Hot Check (Figure 1-1):
   WARNING: Do not use an isolation transformer during this test.
   Use a leakage current tester or a metering system that complies with American National Standards Institute (*ANSI C101.1, Leakage Current for Appliances*), and Underwriters Laboratories (*UL Publication UL1410, 59.7*).
4. With the unit completely reassembled, plug the AC line cord directly into a 120V AC outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, conduit, etc.) and all exposed metal parts, including: metal cabinets, screwheads and control shafts. The current measured should not exceed 0.5 milliamp. Reverse the power-plug prongs in the AC outlet and repeat the test.

1-1-4 Product Safety Notices

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection. The protection they give may not be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by ⚠ on schmatics and parts lists. Asubstitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and / or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

Components identified by ☢ on schematics and parts lists must be sealed by a soldering iron after replacement and adjustment.

1-2 Servicing Precautions

WARNINGS: An electrolytic capacitor installed with the wrong polarity might explode.

Cautions: Before servicing units covered by this service manual, read and follow the Safety Precautions section of this manual.

When replacing the E^2PROM, high voltage step must be adjusted until high voltage becomes 24.5 kV. Standard dump from Softjig does this.

Note: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions.

1-2-1 General Servicing Precautions

1. Servicing precautions are printed on the cabinet, and should be followed closely.
2. Always unplug the unit's AC power cord from the AC power source before attempting to:
   (a) remove or reinstall any component or assembly, (b) disconnect PCB plugs or connectors, (c) connect a test component in parallel with an electrolytic capacitor.
3. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
4. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the area around the serviced part has not been damaged.
5. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).
6. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500 V) to the blades of the AC plug.

   The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
7. Never defeat any of the +B voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.
8. Always connect a test instrument's ground lead to the instrument chassis ground *before* connecting the positive lead; always remove the instrument's ground lead last.

1-3 Electrostatically Sensitive Devices (ESD) Precautions

Some semiconductor (solid state) devices can be easily damaged by static electricity. Such components are commonly called Electrostatically Sensitive Devices (ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors. The following techniques will reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. To avoid a shock hazard, be sure to remove the wrist strap before applying power to the monitor.
2. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of an electrostatic charge.
3. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESDs.
4. Use only a grounded-tip soldering iron to solder or desolder ESDs.
5. Use only an anti-static solder removal device. Some solder removal devices not classified as “anti-static” can generate electrical charges sufficient to damage ESDs.
6. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
7. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   Caution: Be sure no power is applied to the chassis or circuit and observe all other safety precautions.

8. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting your foot from a carpeted floor can generate enough static electricity to damage an ESD.
9. ⚠ Indicates ESDs on the Schematic Diagram in this manual.

2 Product Specifications

2-1 Specifications

Item	Description	
Picture Tube:	CKA42*7L: 14-Inch (36 cm); 13.2-Inch (33.5 cm) viewable, 90° Deflection, CKA5227L: 15-Inch (38 cm); 13.8-Inch (35 cm) viewable, flat-face tube, 90° Deflection, 0.28 mm Dot pitch, Semi-tint, Non-glare, Antistatic silica coating, Invar shadow mask	
Scanning Frequency	Horizontal : 30 kHz to 55 kHz (Automatic) Vertical : 50 Hz to 120 Hz (Automatic)	
Display Colors	Unlimited colors	
Maximum Resolution	Horizontal : 1024 Dots Vertical : 768 Lines	
Input Video Signal	Analog, 0.714 Vp-p positive at 75 Ω, internally terminated	
Input Sync Signal	Separate Sync : TTL level positive/negative	
Maximum Pixel Clock	65 MHz	
Active Display	CKA42*7L	CKA5227L
Horizontal Vertical	255 mm ± 3 mm (4:3 ratio) 191 mm ± 3 mm	267 mm ± 3 mm (4:3 ratio) 200 mm ± 3 mm
Input Voltage	AC 90 to 264 Volts, 60 Hz/50 Hz ± 3 Hz	
Power Consumption	73 Watt (max)	
Dimensions	CKA42*7L	CKA5227L
Unit (W x D x H) Carton (W x D x H)	13.7 x 15.2 x 14.3 Inches (348 x 385 x 362.5 mm) 16.6 x 18.1 x 15.4 Inches (422 x 460 x 390 mm)	14.6 x 15.6 x 14.8 Inches (370 x 395 x 377 mm) 17.9 x 19.6 x 17.0 Inches (454 x 497 x 433 mm)
Weight (Net/Gross)	CKA42*7L : 23.1 lbs (10.5 kg) / 27.3 lbs (12.4 kg) CKA5227L : 27.6 lbs (12.5 kg) / 30.9 lbs (14.0 kg)	
Environmental Considerations	Operating Temperature : 32°F to 104°F (0°C to 40°C) Humidity : 10 % to 80 % Storage Temperature : -4°F to 113°F (-20°C to 45°C) Humidity : 5 % to 95 %	
CRT Code No.		

- CKA42*7L/5227L complies with SWEDAC (MPR II) recommendations for reduced electromagnetic fields.
- Designs and specifications are subject to change without prior notice.

2-2 Pin Assignments

Sync Type / Pin No.	15-Pin Signal Cable Connector (Figure 2-1)
	Separate
1	Red
2	Green
3	Blue
4	GND
5	DDC Return
6	GND-R
7	GND-G
8	GND-B
9	Reserved
10	GND-Sync/Self-raster
11	GND
12	DDC Data
13	H-Sync
14	V-Sync
15	DDC Clock

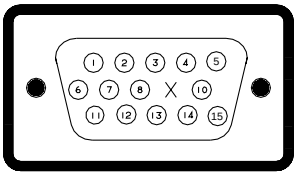


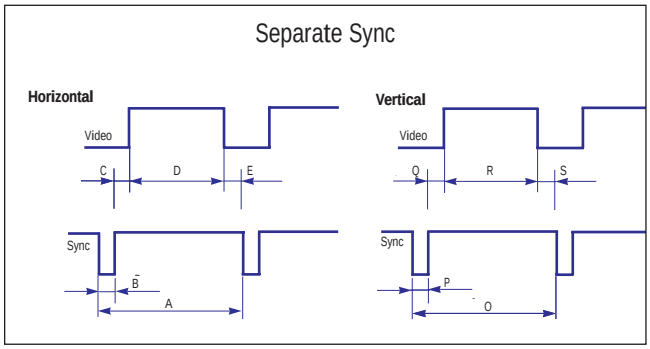
Figure 2-1. Male Type

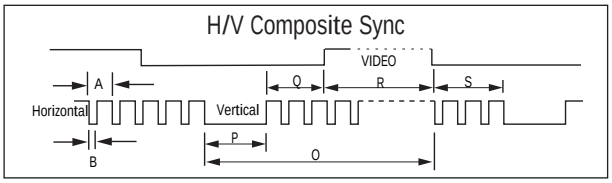
2-3 Timing Chart

This section of the service manual describes the timing that the computer industry recognizes as standard for computer-generated video signals.

Table 2-1. Timing Chart

Mode / Timing	IBM		VESA				
	720/70 Hz 720 x 400	640/60 Hz 640 x 480	640/75 Hz 640 x 480	640/85 Hz 640 x 480	800/75 Hz 800 x 600	800/85 Hz 800 x 600	1024/60 Hz 1024 x 768
fH (kHz)	31.469	31.469	37.500	43.269	46.875	53.674	48.363
A µsec	31.777	31.778	26.667	23.111	21.333	18.631	20.677
B µsec	3.813	3.813	2.032	1.556	1.616	1.138	2.092
C µsec	1.907	1.907	3.810	2.222	3.232	2.702	2.462
D µsec	25.422	25.422	20.317	17.778	16.162	14.222	15.754
E µsec	0.636	0.636	0.508	1.556	0.323	0.569	0.369
fV (Hz)	70.087	59.940	75.000	85.008	75.000	85.061	60.004
O msec	14.268	16.683	13.333	11.764	13.333	11.756	16.666
P msec	0.064	0.064	0.080	0.069	0.064	0.056	0.124
Q msec	1.080	1.048	0.427	0.578	0.448	0.503	0.600
R msec	12.711	15.253	12.800	11.093	12.800	11.179	15.880
S msec	0.413	0.318	0.027	0.023	0.021	0.019	0.062
Clock Frequency (MHz)	28.322	25.175	31.500	36.000	49.500	56.250	65.000
Polarity H.Sync	Negative	Negative	Negative	Negative	Positive	Positive	Negative
V.Sync	Positive	Negative	Negative	Negative	Positive	Positive	Negative
Remark	Separate	Separate	Separate	Separate	Separate	Separate	Separate





A : Line time total	B : Horizontal sync width	O : Frame time total	P : Vertical sync width
C : Back porch	D : Active time	Q : Back porch	R : Active time
E : Front porch		S : Front porch	

Memo

3 Operating Instructions

3-1 Front View and Controls

3-1-1 CKA4227L Front View

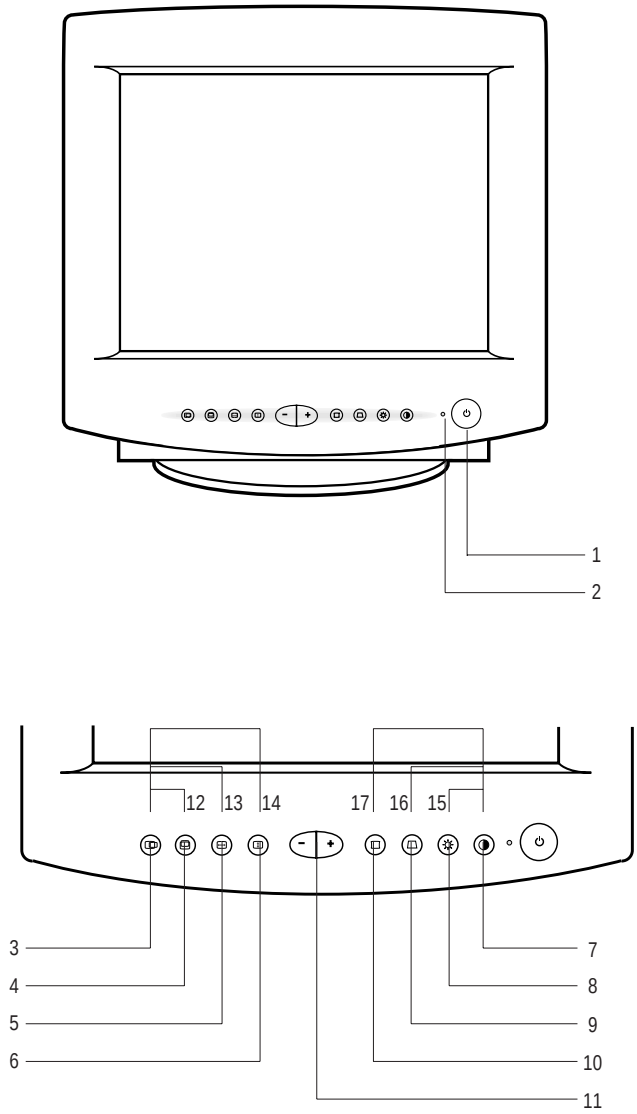


Figure 3-1. Front Control Panel

Table 3-1. Front Panel Controls

Location	Symbol	Description
1		Power Button
2		Power Indicator LED (Dual Color)
3		Horizontal Position Button
4		Vertical Position Button
5		Horizontal Size Button
6		Vertical Size Button
7		Contrast Control
8		Brightness Control
9		Trapezoid Button
10		Side Pincushion Button
11		Adjustment Buttons
12	+	Parallelogram
13	+	V-Linearity
14	+	Pinbalance Button
15	+	Degauss
16	+	Recall
17	+	User Delete

3-1-2 CKA5227L Front View

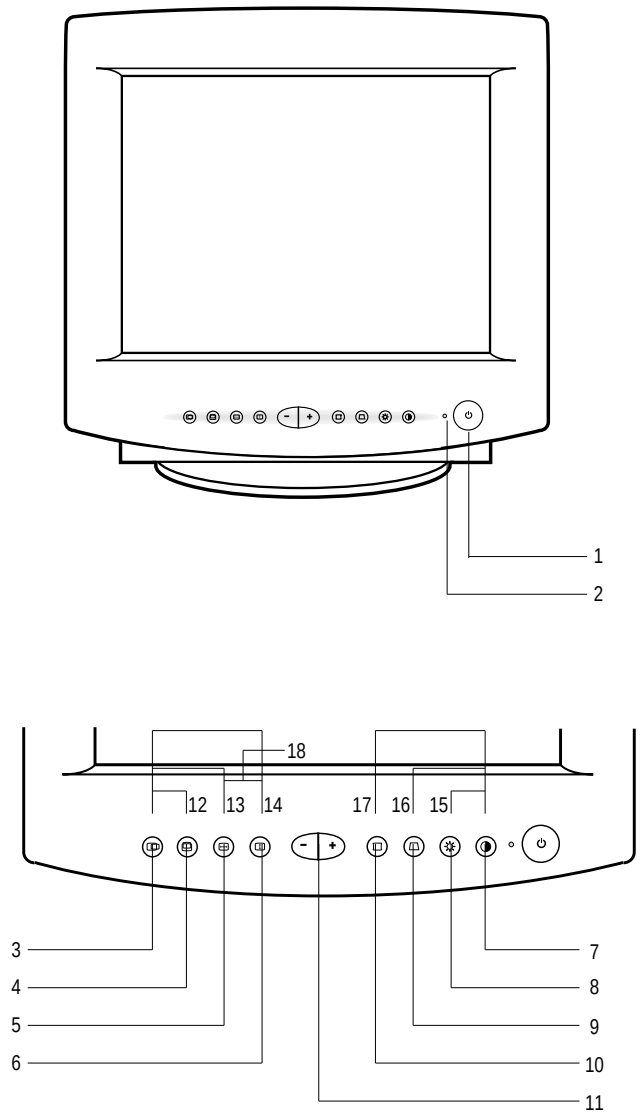


Figure 3-2. Front Control Panel

Table 3-2. Front Panel Controls

Location	Symbol	Description
1		Power Button
2		Power Indicator LED (Dual Color)
3		Horizontal Position Button
4		Vertical Position Button
5		Horizontal Size Button
6		Vertical Size Button
7		Contrast Control
8		Brightness Control
9		Trapezoid Button
10		Side Pincushion Button
11		Adjustment Buttons
12	+	Parallelogram
13	+	V-Linearity
14	+	Pinbalance Button
15	+	Degauss
16	+	Recall
17	+	User Delete
18	+	Tilt (Optional)

3-1-3 CKA4217L Front View

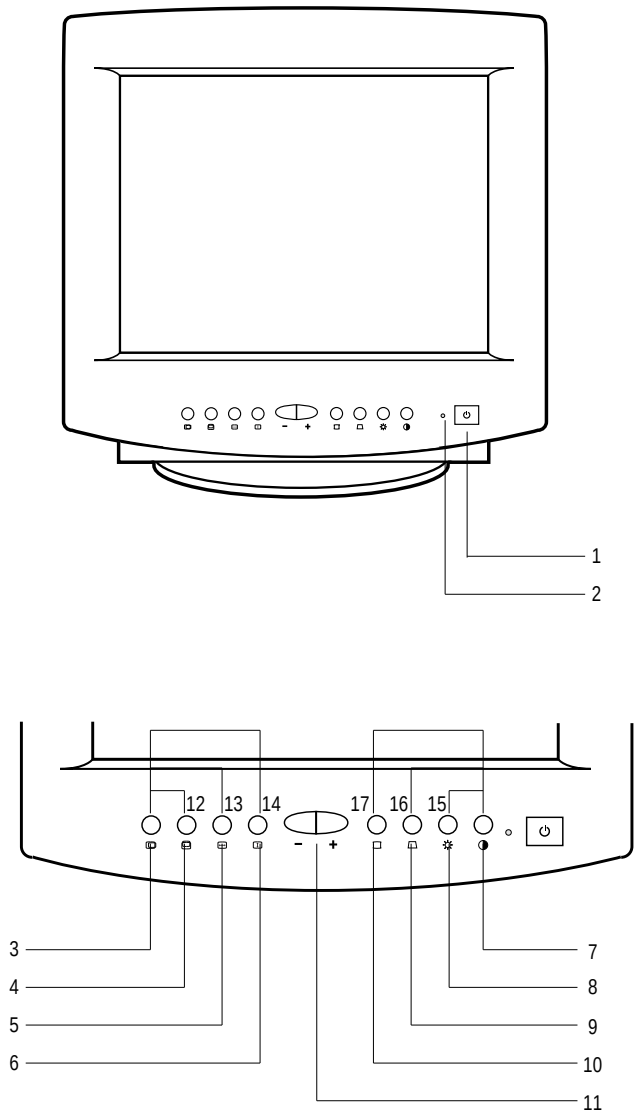


Figure 3-3. Front Control Panel

Table 3-3. Front Panel Controls

Location	Symbol	Description
1		Power Button
2		Power Indicator LED (Dual Color)
3		Horizontal Position Button
4		Vertical Position Button
5		Horizontal Size Button
6		Vertical Size Button
7		Contrast Control
8		Brightness Control
9		Trapezoid Button
10		Side Pincushion Button
11		Adjustment Buttons
12	+	Parallelogram
13	+	V-Linearity
14	+	Pinbalance Button
15	+	Degauss
16	+	Recall
17	+	User Delete

Note 1: When used with a computer equipped with VESA DPMS functions, this monitor is EPA Energy Star compliant and NUTEK compliant.

Table 3-4. Display Power Management Signaling (DPMS); CKA42*7L

State / Items	Normal Operation	Power saving function EPA/NUTEK		
		Stand-By Mode	Suspend Mode Position A	Power Off Mode Position B
Horizontal Sync	Active	Inactive	Active	Inactive
Vertical Sync	Active	Active	Inactive	Inactive
Video	Active	Blanked	Blanked	Blanked
Power Indicator	Green	Green Blinking (0.5 sec interval)	Green Blinking (1 sec interval)	Green Blinking (1 sec interval)
Power Consumption/hr	73 W (max.) 55 W (nominal)	50 W (nominal)	Less than 15 W	Less than 5 W

Table 3-5. Display Power Management Signaling (DPMS); CKA5227L

State / Items	Normal Operation	Power saving function EPA/NUTEK		
		Stand-By Mode	Suspend Mode Position A	Power Off Mode Position B
Horizontal Sync	Active	Inactive	Active	Inactive
Vertical Sync	Active	Active	Inactive	Inactive
Video	Active	Blanked	Blanked	Blanked
Power Indicator	Green	Green Blinking (0.5 sec interval)	Green Blinking (1 sec interval)	Green Blinking (1 sec interval)
Power Consumption/hr	73 W (max.) 60 W (nominal)	50 W (nominal)	Less than 15 W	Less than 5 W

4 Disassembly and Reassembly

This section of the service manual describes the disassembly and reassembly procedures for the CKA42*7L/5227L monitors.

WARNING: This monitor contains electrostatically sensitive devices. Use caution when handling these components.

4-1 Disassembly

Cautions: 1. Disconnect the monitor from the power source before disassembly.
2. Follow these directions carefully; never use metal instruments to pry apart the cabinet.

4-1-1 Cabinet Disassembly

1. With a pad beneath it, stand the monitor on its front with the screen facing downward and the base closest to you. Make sure nothing will damage the screen.
2. Press in the tab on the Cabinet Bottom and pull the Tilt and Swivel Base upward to remove it.
3. Working from the back of the monitor, remove the four screws and remove the Rear Cover.
4. Using pinch-nose pliers or long-nose pliers, carefully disconnect the Anode Cap from the CRT.

Caution: Do not touch the anode contact on the CRT.

4-1-2 Removing the CRT Socket PCB

1. Complete all previous steps.
2. Disconnect CRT and Main PCB ground wires on CRT Socket PCB and Shield Cover.
3. Desolder the 5 tabs on the underside of the CRT Socket PCB shield and remove the CRT Socket PCB Shield.
4. Using a knife, cut through the silicone bond and lift off the CRT Socket PCB.
5. Disconnect connectors CN102 and two ground wires on the CRT Socket PCB.

4-1-3 Removing the Main PCB

1. Complete all previous steps.
2. Disconnect Degaussing Coil at the CN601 connector on the Main PCB.
3. Disconnect all easily accessible ground wires on the Main PCB and Chassis Bottom.
4. Disconnect the DY connector between the DY and the CN301, CN302, CN502 and CN503 connector on the Main PCB.
5. Remove the screws on the back and along each side of the Chassis Bottom.
6. Carefully lift the Main PCB Ass'y.
7. Remove all other ground wires.

4-1-4 CRT Ass'y Disassembly

1. Complete all previous steps.
2. Straighten the Degaussing Coil Assembly coated metal ties and lift Coil Ass'y from the CRT.
3. Remove the four corner screws and lift the CRT up and away from the Front Cover Assembly and place it on a padded surface.

Caution: Do not lift the CRT by the neck.
If you will be returning this CRT to the monitor, be sure to place the CRT face downward on a protective pad.

4-2 Reassembly

With the CRT facing downward on a protective pad, use the steps that follow to reassemble the monitor.

4-2-1 Replacing the CRT

1. Loop the CRT Ground Ass'y around the back of the CRT and under the four corner metal ears. Position last the corner with the spring.
2. With the Front Cover Assembly lying face down on a protective pad, position the CRT so that the corner metal ears fit properly in the Front Cover Assembly.
3. Secure the CRT ground Ass'y and CRT at each of the four corners with the CRT screws.
4. Replace the Degaussing Coil Assembly and wrap the Coil with the plastic coated metal ties to hold the Coil in place.

4-2-2 Replacing the Main PCB

1. Stand the monitor on its front with the screen facing downward.
2. Slide the Main PCB into the Chassis Bottom and replace the wires and screws on the Chassis Bottom.
3. Position the Main PCB Ass'y in the front Cabinet and secure it with the screws.
4. Replace both side CRT ground wires on the Chassis Bottom.
5. Replace the Degaussing Coil at the CN601 connector on the Main PCB.
6. Replace the DY connector at the CN301, CN302, CN502 and CN503 connector on the Main PCB.
7. Replace all easily accessible ground wires on the Main PCB and Chassis Bottom.
8. Replace the Anode Cap.

4-2-3 Replacing the CRT Socket PCB

1. Lock the Focus (G3) wire on the CRT Socket and reconnect the Screen (G2) wire on the CRT Socket PCB.
2. Reconnect the CRT Socket on the CRT pins and apply silicon bond at the Plug/Socket Junction.
3. Replace the CRT and Main PCB ground wires on CRT Socket PCB and Shield Cover.
4. Reconnect the connectors CN102 to the CRT Socket PCB.
5. Solder the 5 tabs on the underside of the CRT Socket Shield.

4-2-4 Cabinet Reassembly

1. Complete all previous steps.
2. Position the Rear Cover marking sure the tabs along the front edge are properly snapped in place. Replace the four screws.
3. Snap the Tilt and Swivel Base into position.
4. Set the monitor on its Base and make sure that the CRT faceplate was not scratched or otherwise damaged.

5 Alignment and Adjustments

This section of the service manual explains how to make permanent adjustments to the monitor. Directions are given for adjustments using the monitor Interface Board Ver. 2.0 and software (SoftJig).

5-1 Adjustment Conditions

Caution: Changes made without the SoftJig are saved only to the user mode settings. As such, the settings are not permanently stored and may be inadvertently deleted by the user.

5-1-1 Before Making Adjustments

5-1-1 (a) ORIENTATION

When servicing, always face the monitor to the east.

5-1-1 (b) MAGNETIC FIELDS

Whenever possible, use magnetic field isolation equipment such as a Helmholtz field to surround the monitor. If a Helmholtz field is not available, frequently degauss the unit under test.

Caution: Other electrical equipment may cause external magnetic fields which may interfere with monitor performance.

Use an external degaussing coil to limit magnetic build up on the monitor. If an external degaussing coil is not available, use the internal degaussing circuit. However, do not use the internal degaussing circuit more than once per 30 minutes.

5-1-1 (c) WARM-UP TIME

The monitor must be on for 30 minutes before starting alignment procedures. Warm-up time is especially critical in Color Temperature and White Balance adjustments.

5-1-1 (d) SIGNAL

Analog, 0.714 Vp-p positive at 75 ohm, internal termination
Sync: Separate
(TTL level negative / positive)

5-1-1 (e) SCANNING FREQUENCY

Horizontal: 30 kHz to 55 kHz (automatic)
Vertical: 50 Hz to 120 Hz (automatic)

Unless otherwise specified, adjust at the 800 x 600 mode (H : 53.7 kHz, V: 85 Hz) signals.

Refer to Table on page 2-5.

5-1-1 (f) +B 13 V LINE CHECK

No beam
Contrast: Maximum
Brightness: Maximum

Check the DC 13 V ± 0.2 V at Cathode of D616 Point and GND.

5-1-1 (g) HIGH VOLTAGE CHECK

No beam
Contrast: Maximum
Brightness: Maximum

Check the high voltage to 24.5 ± 0.5 kV at anode and GND.

5-1-1 (i) CENTER RASTER

Adjust SW401 so that the back raster comes to the center when you apply a signal of 53.7 kHz / 85 Hz.

5-1-1 (j) BRIGHTNESS AND CONTRAST

Unless otherwise specified, adjust brightness and contrast buttons:

Brightness: Maximum
(press ⊕ button until the LED is blink)
Contrast: Maximum
(press ⊕ button until the LED is blink)

5-1-2 Required Equipment

The following equipment may be necessary for adjustment procedures:

5-1-2 (a) DISPLAY CONTROL ADJUSTMENT

1. Non-metallic (–) screwdriver: 1.5 mm
   Non-metallic (–) screwdriver: 3 mm
2. Philips (+) screwdriver: 1.5 mm
3. Non-metallic hexkey: 2.5 mm
4. Digital Multimeter (DMM), or
   Digital Voltmeter (DVM)
5. Signal generator, or
   Computer with a video board that uses the ET-4000 chipset (strongly recommended if using Samsung DM 200 software) and that displays: 800 x 600 @ 85 Hz, or 800 x 600 @ 75 Hz (minimum).
6. Personal computer
7. Required software: Softjig.exe from Samsung, Samsung DM200, or DisplayMate for Windows from Sonera Technologies
8. Interface Board Ver. 2.0 Code No. BH81-90001K
9. Parallel communications cable (25-pin to 25-pin); Code No. BH81-90001H
10. Signal cable (15-pin to 15-pin cable with additional 3-pin connector); Code No. BH81-90001J
11. 5 V DC adapter, not supplied

Note: SoftJig Assembly (includes items 8, 9 and 10 Code No. BH81-90001L

5.1-2 (b) COLOR ADJUSTMENTS

1. All equipment listed in 5-1-2 (a), above
2. Color analyzer, or any luminance measurement equipment

5-1-3 Connecting the SoftJig

Connect the monitor to the signal generator and/or PC as illustrated in Figures 5-1 and 5-2.

Note: The signal cable connector which includes the 3-wire cable must connect to the monitor. If you use Setup 2 (PC only, no signal generator) you can only make adjustments to the signal timing available on that computer system. To make corrections to all factory timings requires the use of an additional signal generator.

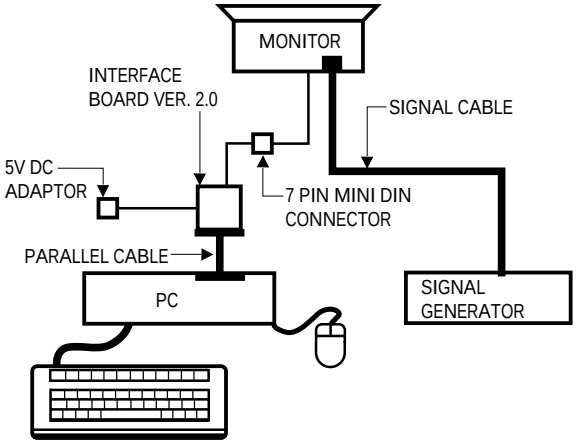


Figure 5-1 : Setup 1, With Signal Generator

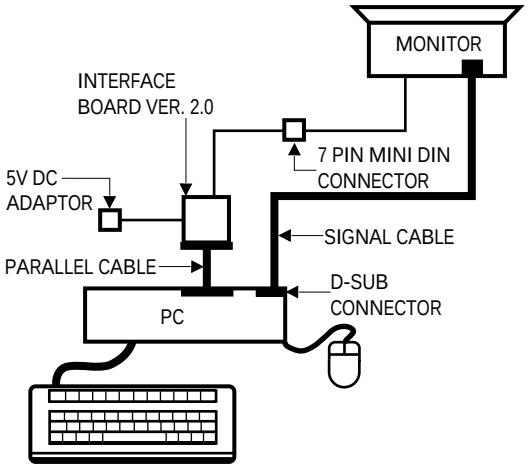


Figure 5-2. Setup 2, Without Signal Generator

5-1-4 After Making Adjustments

After finishing all adjustments, test the monitor in all directions. If, for example, the monitor does not meet adjustment specifications when facing north, reposition the monitor to face east and readjust. This time, try for an adjustment closer to the ideal setting within the tolerance range. Test the unit again in all directions. If the monitor again fails to meet specifications in every direction, contact your Regional After Service Center for possible CRT replacement.

5-2 Display Control Adjustments

5-2-1 Centering

Centering means to position the center point of the display in the middle of the display area. Horizontal size and position and vertical size and position control the centering of the display.

Adjust the horizontal size and vertical size to their optimal settings: 267 mm (H) x 200 mm (V) for 15", 255 mm (H) x 191 mm (V) for 14"

Adjust the horizontal position and vertical position to within 4.0 mm of the center point of the screen.

l A - B l ≤ 4.0 mm.
l C - D l ≤ 4.0 mm.

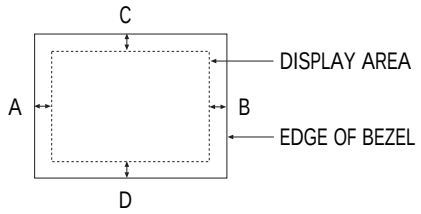


Figure 5-1. Centering

5-2-1 (a) HORIZONTAL SIZE ADJUSTMENT

CONDITIONS

Scanning frequency:	53.7 kHz / 85 Hz (15")
	43.8 kHz / 85 Hz (14")
Display image:	Crosshatch pattern
Brightness:	Maximum
Contrast:	Maximum

Adjust the horizontal size of the display pattern to 267 mm (15") and 255 mm (14").
(Tolerance ± 3 mm.)

If horizontal size range cannot meet the spec adjust the VR401.

5-2-1 (b) VERTICAL SIZE ADJUSTMENT

CONDITIONS

Scanning frequency:	53.7 kHz / 85 Hz (15")
	43.8 kHz / 85 Hz (14")
Display image:	Crosshatch pattern
Brightness:	Maximum
Contrast:	Maximum

Adjust the vertical size of the display pattern to 200 mm (15") and 191 mm (14").
(Tolerance: ± 3 mm.)

5-2-1 (c) HORIZONTAL POSITION ADJUSTMENT

CONDITIONS

Scanning frequency:	53.7 kHz / 85 Hz (15")
	43.8 kHz / 85 Hz (14")
Display image:	Crosshatch pattern

PROCEDURE

Center the test pattern on the raster.

5-2-1 (d) VERTICAL POSITION ADJUSTMENT

CONDITIONS

Scanning frequency:	53.7 kHz / 85 Hz (15")
	43.8 kHz / 85 Hz (14")
Display image:	Crosshatch pattern

Center the test pattern on the raster.

5-2-2 Linearity

Linearity affects the symmetry of images as they appear on the screen. Unless each row or column of blocks in a crosshatch pattern is of equal size, or within the tolerances shown in Tables 5-1 and 5-2, an image appears distorted, elongated or squashed.

The formular of linearity (%)

$$= \frac{2 \times (Max - Min)}{Max + Min} \times 100$$

Table 5-1. Standard Modes Linearity: 800x600/85Hz

	Standard Timing Modes	
	Each block (10 %)	Difference between adjacent blocks (4 %)

Table 5-2. Other Modes Linearity: VGA, SVGA, XGA, MAC, etc.

	Supported Timing Mode	
	Each block (14 %)	Difference between adjacent blocks (5 %)

5-2-3 Trapezoid Adjustment

CONDITIONS

Scanning frequency: 53.7 kHz / 85 Hz (15")
43.8 kHz / 85 Hz (14")
Display image: Crosshatch pattern

Make the the test pattern rectangular.

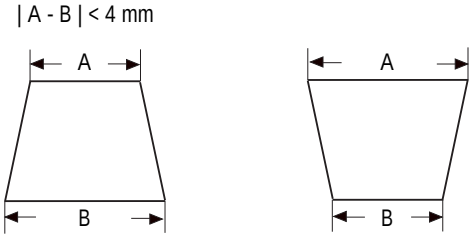


Figure 5-2. Trapezoid

5-2-4 Parallelogram Adjustment

CONDITIONS

Scanning frequency: 53.7 kHz / 85 Hz (15")
43.8 kHz / 85 Hz (14")
Display image: Crosshatch pattern

To activate the Parallelogram Adjustment function, push both the Horizontal Position and Vertical Position buttons and hold them in for longer than 3 seconds, or until the power indicator LED changes from green to blink and back to green.

Use the Increase (+) and Decrease (–) buttons to correct the display shape.

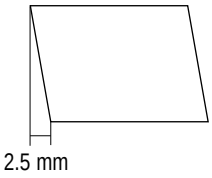


Figure 5-3. Parallelogram

5-2-5 Side Pincushion Adjustment

CONDITIONS

Scanning frequency: 53.7 kHz / 85 Hz (15")
43.8 kHz / 85 Hz (14")
Display image: Crosshatch pattern

After pushing the Side Pincushion button once, push the Increase (+) and Decrease (–) buttons to straighten the sides of the test pattern.

| C1 |, | C2 | ≤ 1.5 mm, | D1 |, | D2 | ≤ 1.5 mm.

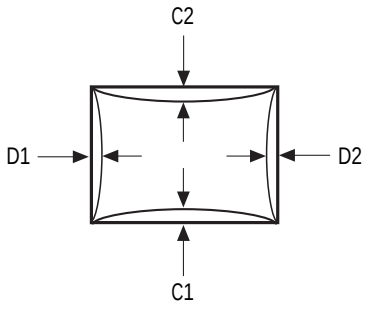


Figure 5-4. Pincushion

5-2-6 CRT Tilt Adjustment

TILT ADJUSTMENT (CKA5227L With Tilt)

Push the V-Posi and H-Size simultaneously until Led blinks and back on again. Push the Increase (+) and Decrease)–) buttons to correct the Tilt.

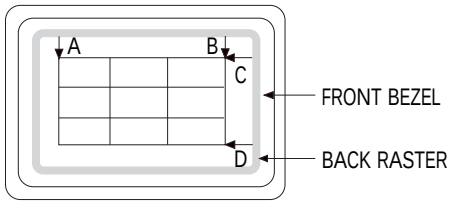


Figure 5-5. CRT Tilt Adjustment

5-2-7 Vertical Linearity Adjustment

To activate the vertical linearity adjustment, push both the horizontal position and horizontal size buttons and hold then in for longer than 3 seconds, or until the power indicator LED changes from green to blink and back to green.

Use the Increase (+) and Decrease (–) buttons to correct the display shape.

5-2-8 Pin Balance Adjustments

To activate the pin balacne function, push both the horizontal position and vertical position buttons and hold then in for longer than 3 seconds, or until the power indicator LED changes from green to blink and back to green.

Use the Increase (+) and Decrease (–) buttons to correct the display shape.

5-2-9 Degauss

Push the contrast and brightness buttons simultaneously. The degaussing circuit can effectively function only once per 30 minutes. If available, use an external degaussing coil during servicing.

WARNING: Do Not hold the Degauss button down for longer than 3 seconds. If you do, it resets all of the data in the user memory area. If this occurs, you must remake the user adjustments.

5-2-10 Delete User Mode Data

To delete the picture data from the user modes, push the contrast button and side pincushion button for 5 or more seconds simultaneously.

5-2-11 Recall

To delete the picture data from current user mode, push the contrast button and trapzoid button for 5 or more seconds simultaneoulsy.

5-3 Color Adjustments

Note: To make color adjustments you must have a color analyzer and one of the following configurations:

1. Signal Generator
   or
2. Computer with Samsung DM 200 software or DisplayMate for Windows software from Sonera Technologies
3. In case of CKA5227L, use 800 x 600 mode signal (53.7 kHz/85 Hz) for adjustments, in case of CKA42*7L, use 640 x 480 mode signal (43.8 kHz/85 Hz).

Before making adjustments, check that the video signals are as follows:

Video : Analog, 0.714 Vp-p (at 75 Ω termination)
Sync : Separate TTL level
Unless otherwise specified, use 800 x 600 mode signal (53.7 kHz/85 Hz) for adjustments.

5-3-1 Color Coordinates (Temperature)

Color temperature is a measurement of the radiant energy transmitted by a color. For computer monitors, the color temperature refers to the radiant energy transmitted by white. Color coordinates are the X and Y coordinates on the chromaticity diagram of wavelengths for the visible spectrum.

CONDITIONS

Measurement instrument:	Color analyzer
Scanning frequency:	53.7 kHz/85 Hz (15”)
	43.8 kHz/85 Hz (14”)
Display image:	White flat field at center of display area
Luminance:	Maximum

PROCEDURE

Using the directions in sections 5-3-2 through 5-3-5, adjust the Color Coordinates for 9300° K to x = 0.283 ± 0.02 and y = 0.298 ± 0.02

5-3-2 Back Raster Color Adjustment

CONDITIONS

Measurement instrument:	Color analyzer
Scanning frequency:	53.7 kHz/85 Hz (15”)
	43.8 kHz/85 Hz (14”)
Display image:	Back raster pattern
Brightness:	Maximum
Contrast:	Maximum

PROCEDURE

1. Adjust the Screen VR on the FBT so that the brightness of the Back Raster is 0.3 to 0.5 ft-L (typically 0.4 ft-L).
2. Adjust VR102R (R-Bias) and VR102B (B-Bias) so Back Raster color is white. (x = 0.283 ± 0.02 and y = 0.298 ± 0.02)

5-3-3 Video Gain Adjustment

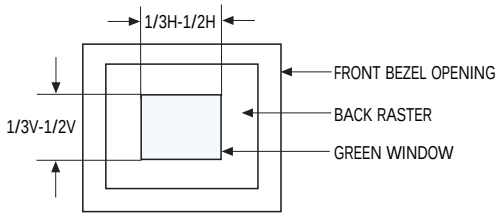


Figure 5-6. Green Box Pattern

CONDITIONS

Measurement instrument:	Color analyzer
Scanning frequency:	53.7 kHz/85 Hz (15”)
	43.8 kHz/85 Hz (14”)
Display image:	Green box pattern within range for which the ABL circuit is not active (1/3 to 1/2H and 1/3 to 1/2V).
Brightness:	Maximum
Contrast:	Maximum

PROCEDURE

1. Adjust VR102 (G-Gain) so that the brightness of the green gain is 40 ± 1 ft-L (typically 40 ft-L).

5-3-4 White Balance Adjustment

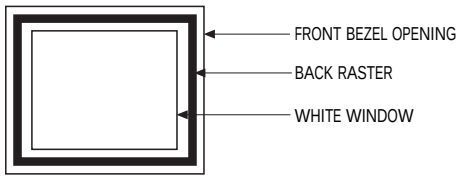


Figure 5-7. Full White Pattern

CONDITIONS

Measurement instrument:	Color analyzer
Scanning frequency:	53.7 kHz/85 Hz (15”)
	43.8 kHz/85 Hz (14”)
Display image:	Full white pattern
Brightness:	Maximum
Contrast:	Maximum

PROCEDURE

1. Display the full white pattern.
2. Adjust VR101 (R-Gain) and VR103 (B-Gain) so that the video is white.
   (x = 0.283 ± 0.02 and y = 0.298 ± 0.02)

5-3-5 White Balance Fine Adjustment

CONDITIONS

Measurement instrument:	Color analyzer
Scanning frequency:	53.7 kHz/85 Hz (15”)
	43.8 kHz/85 Hz (14”)
Display image:	Full white pattern
X-Y coordinates:	x = 0.283 ± 0.02
	y = 0.298 ± 0.02

PROCEDURE

1. Adjust the Contrast control so that the brightness of the video is about 5 ft-L.
2. Check whether the white coordinates of the video meet the specification above. If they do not, adjust them so that they do.
3. Adjust the Contrast to maximum luminance.
4. Check whether the white coordinates still meet the specification above. If they do not, adjust them so that they do.

5-3-6 ABL Point Adjustment

CONDITIONS

Measurement instrument:	Color analyzer
Scanning frequency:	53.7 kHz/85 Hz (15”)
	43.8 kHz/85 Hz (14”)
Display image:	Full white pattern
Brightness:	Maximum
Contrast:	Maximum

PROCEDURE

Adjust VR501 (ACL) so that the brightness level is 40 ± 1 ft-L.

5-3-7 Focus Adjustment

CONDITIONS

Measurement instrument:	Color analyzer
Scanning frequency:	53.7 kHz/85 Hz (15”)
	43.8 kHz/85 Hz (14”)
Display image:	“H” character pattern
Brightness:	Maximum
Contrast:	Maximum

PROCEDURE

1. Adjust the Focus VR on the FBT to display the sharpest image possible.
2. Use Locktite to seal the Focus VR in position.

5-3-8 Luminance Uniformity Check

CONDITIONS

Measurement instrument:	Color analyzer
Scanning frequency:	53.7 kHz/85 Hz (15”)
	43.8 kHz/85 Hz (14”)
Display image:	White flat field
Brightness:	Cut off point at 30 ft-L

PROCEDURE

Measure luminance at nine points on the display screen: top left corner, top center, top right corner, center row left side, center, center row right side, bottom left corner, bottom center, and bottom right corner.

5-3-9 Color Purity Adjustment

Color purity is the absence of undesired color. Conspicuous mislanding (unexpected color in a uniform field) within the display area shall not be visible at a distance of 50 cm from the CRT surface.

CONDITIONS

Orientation:	Monitor facing east
Scanning frequency:	53.7 kHz/85 Hz (15”) 43.8 kHz/85 Hz (14”)
Display image:	White flat field
Luminance:	Cutoff point at the center of the display area

Caution: Color purity adjustments should only be attempted by qualified personnel.

PROCEDURE

For trained and experienced service technicians only.

Use the following procedure to correct minor color purity problems:

1. Make sure the display is not affected by external magnetic fields. Use an external degaussing coil to neutralize magnetic fields which may be affecting color purity.
2. Very carefully break the glue seal between the 2-pole purity convergence magnets (PCM), the band and the spacer (see Figure 5-9).
3. Make sure the spacing between the PCM assembly and the CRT stem is 22.5 mm ± 1 mm.
4. Display a red pattern over the entire display area.
5. Adjust the Purity Magnet Rings on the PCM assembly to display a pure green pattern. (Optimal setting: x = x = 0.310 ± 0.015, y = 0.592 ± 0.015)
6. Repeat steps 4 and 5 using a red pattern and then again, using a blue pattern.

Table 5-3. Color Purity Tolerances

Red:	x = 0.625 ± 0.015	y = 0.340 ± 0.015
Green:	x = 0.310 ± 0.015	y = 0.592 ± 0.015
Blue:	x = 0.150 ± 0.015	y = 0.063 ± 0.015

(For 9300°K white color adjustment: x = 0.283 ± 0.02, y = 0.298 ± 0.02)

7. When you have the PCMs properly adjusted, carefully gule them together with Locktite to prevent their movement during shipping.

5-4 Convergence Adjustments

Misconvergence occurs when one or more of the electron beams in a multibeam CRT fail to meet the other beams at a specified point.

Table 5-4. Misconvergence Tolerances

Position	Error in mm	CRT Dot Pitch
Center (A)	0.30	0.28
Edge (B)	0.40	0.28

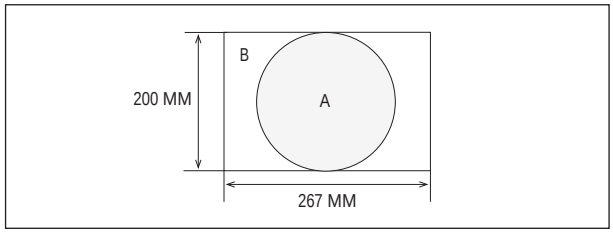
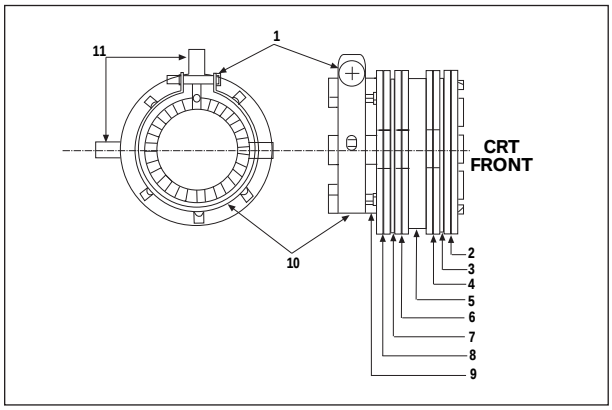


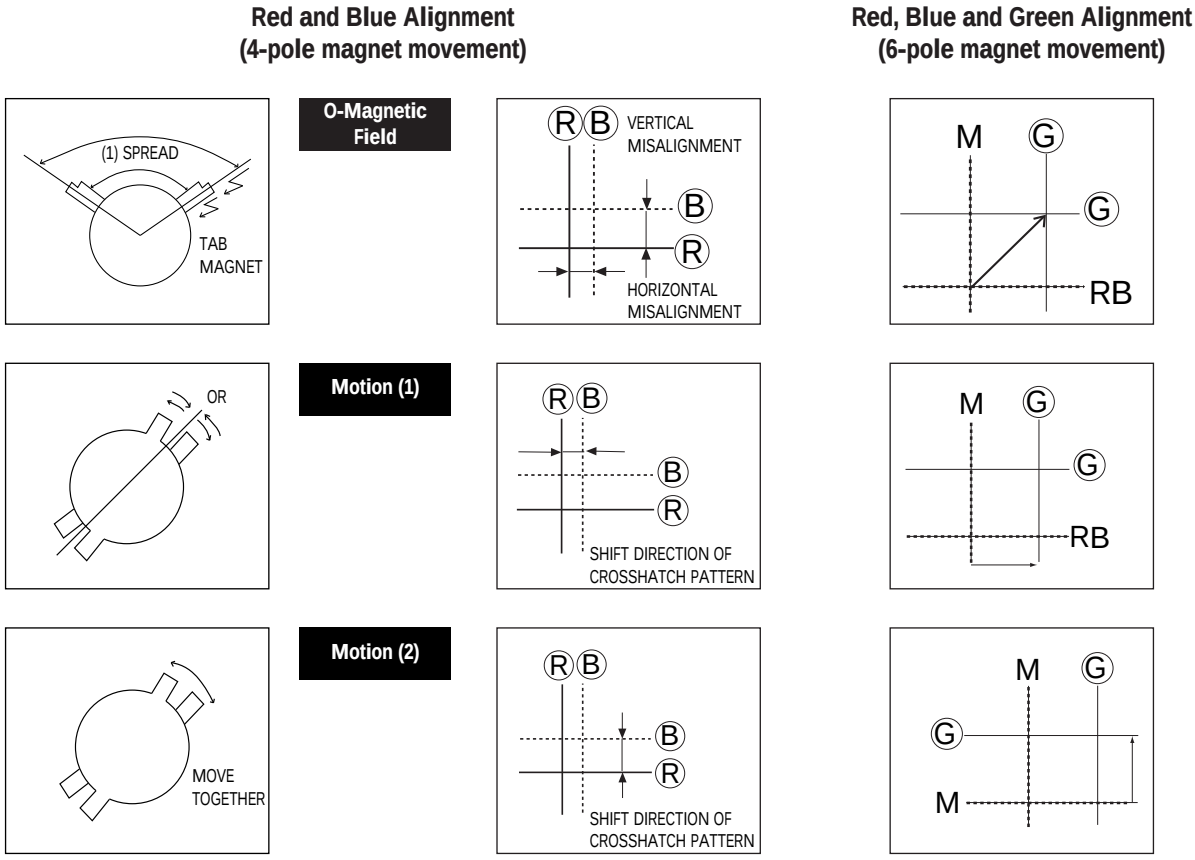
Figure 5-8. Convergence Measurement Areas



Toshiba CRT			
1 Setup Bolt	2 Bow Magnet	3 Spacer	4 2-Pole Magnet
5 Band	6 6-Pole Magnet	7 Spacer	8 4-Pole Magnet
9 Holder	10 Band	11 Tabs	

Figure 5-9. Magnet Configuration

Figure 5-10. Magnet Movements



5-4-1 Static (Center) Convergence

Static convergence involves alignment of the red, blue and green lines in the center area of the display.
See “Dynamic Convergence” for alignment of color fields around the edges of the display.

CONDITIONS

Direction: Monitor facing east
Warm-up: 30 minutes
Display image: Crosshatch pattern
Tolerances: See Table 5-5

PROCEDURE

As shown in Figure 5-9, the CRT used in this monitor has the magnet configuration as shown in Table 5-6.

Table 5-5. Magnet Configurations

CRT Manufacturer	Magnet Order from Front of CRT
Toshiba	Convergence bow, 2-pole, 6-pole, 4-pole

Use the following steps to correct any static misconvergence:

1. Locate the pair of 4-pole magnet rings.
2. Unlock the rings and rotate the individual rings (change the spacing between tabs) to converge the vertical red and blue lines.
3. Rotate the pair of rings (maintaining spacing between tabs) to converge the horizontal red and blue lines.
4. After completing the red and blue center convergence adjustment, locate the pair of 6-pole magnet rings.
5. Rotate the individual rings (change the spacing between tabs) to converge the vertical red and blue (magenta) and green lines.
6. Rotate the pair of rings (maintaining the spacing between tabs) to converge the horizontal red and blue (magenta) and green lines. Don’t rotate the 2-pole magnets as they adjust for color purity.
7. Mark the correct position for the magnets and apply a small line of glue to hold the magnets in place. Lock the rings in place.

5-4-2 Dynamic (Edge) Convergence

CONDITIONS

Direction: Monitor facing east
Warm-up: 30 minutes
Display image: Crosshatch pattern
Tolerances: See Table 5-5

PROCEDURE

Use the following procedure to correct minor dynamic (edge) misconvergence. If, after using this procedure, dynamic misconvergence is still greater than the tolerance around the periphery of the display area, contact the Regional After Service Center for possible CRT replacement.

1. Make sure the display is not affected by external magnetic fields.
2. Make sure the static convergence is properly adjusted.
3. Strategically place small magnet rubbers on the back of the CRT to correct the misconvergence. Be careful not to remove the paper protecting the adhesive on the magnet rubbers until you are satisfied with their placement and the dynamic convergence.
4. When you are satisfied with the convergence around the edge of the CRT, permanently glue the magnet rubbers to the back of the CRT.

WARNING: Do not remove or change the position of the factory installed wedges. These wedges were installed by the CRT manufacturer and are properly placed for this CRT; their removal may result in damage to the CRT.

5-4-3 Bow Convergence Adjustments

CONDITIONS

Orientation: Monitor facing east.
Display Image: Crosshatch pattern with mixed RGB colors.
Required tools: Philips (+) screwdriver, 1.5 mm Hexkey, 2.5 mm

PROCEDURE

Bow convergence adjustments are not available for the CRTs used in the CKA42*7L/5227L monitors. While all CRTs have bow convergence magnets, they are sealed in the CRT factory and are not user or service technician adjustable. Do not touch these magnets (see Figure 5-9). If bow convergence adjustment is out of alignment, replace the CRT.

Bow misconvergence should not exceed the values listed in Table 5-5: Misconvergence Tolerances.

5-4-4 Balance Convergence Adjustments

Balance Convergence involves alignment of red and blue lines when they are misaligned at one end more so than at the other end. The Deflection Yoke holds the balance coils which can correct balance misconvergences.

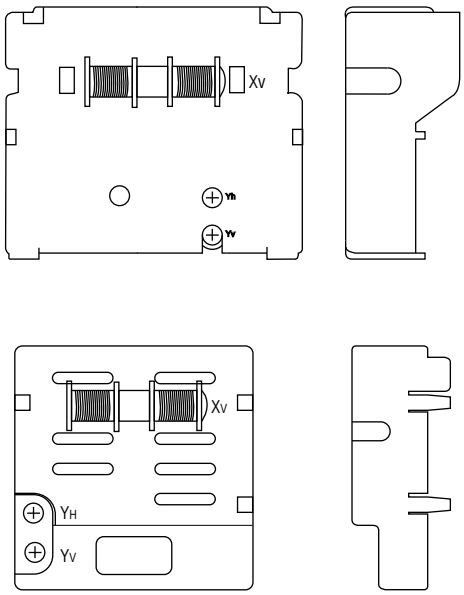


Figure 5-11. Deflection Yoke Caps

5-4-4 (a) HORIZONTAL LINE RED AND BLUE BALANCE CONVERGENCE

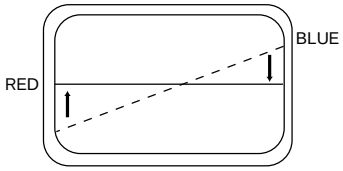


Figure 5-12. Horizontal Line Balance Misconvergence

PROCEDURE

Use a 2.5 mm hexkey at the Horizontal Balance Coil (Xv). Turning it right raises the right end of the blue line and lowers the left end. Turning the VR to the left lowers the right end of the blue line and raises the left end.

5-4-4 (b) VERTICAL RED AND BLUE BALANCE CONVERGENCE

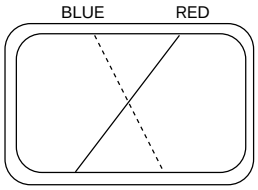


Figure 5-13. Vertical Line Balance Misconvergence

PROCEDURE

Use a 1.5 mm phillips (+) screwdriver at the YH variable resistor. Turning the VR to the left tilts the blue line to the right. Turning it right tilts the blue line to the left.

5-4-4 (c) UPPER AND LOWER HORIZONTAL LINE CONVERGENCE

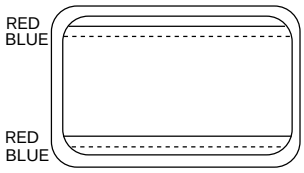


Figure 5-14. Upper and Lower Balance Misconvergence

PROCEDURE

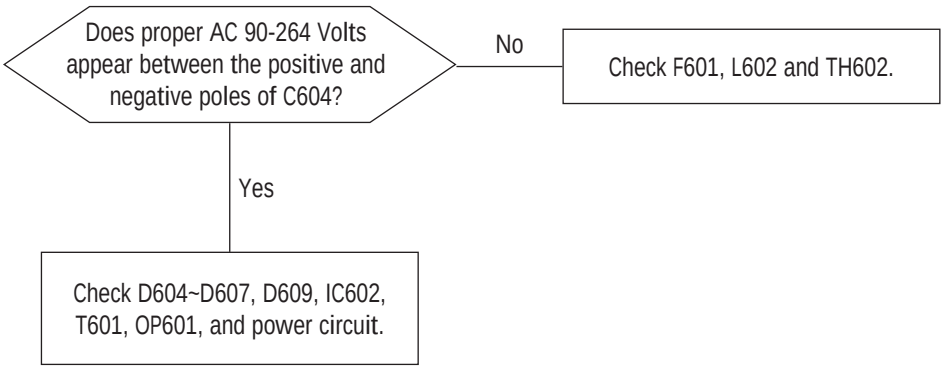
Use a 1.5 mm phillips (+) screwdriver at theYv variable resistor. Turning the VR to the left moves the blue line at the top upward and at the bottom, the line moves downward. Turning it right moves the blue line at the top downward and at the bottom the line moves upward.

6 Troubleshooting

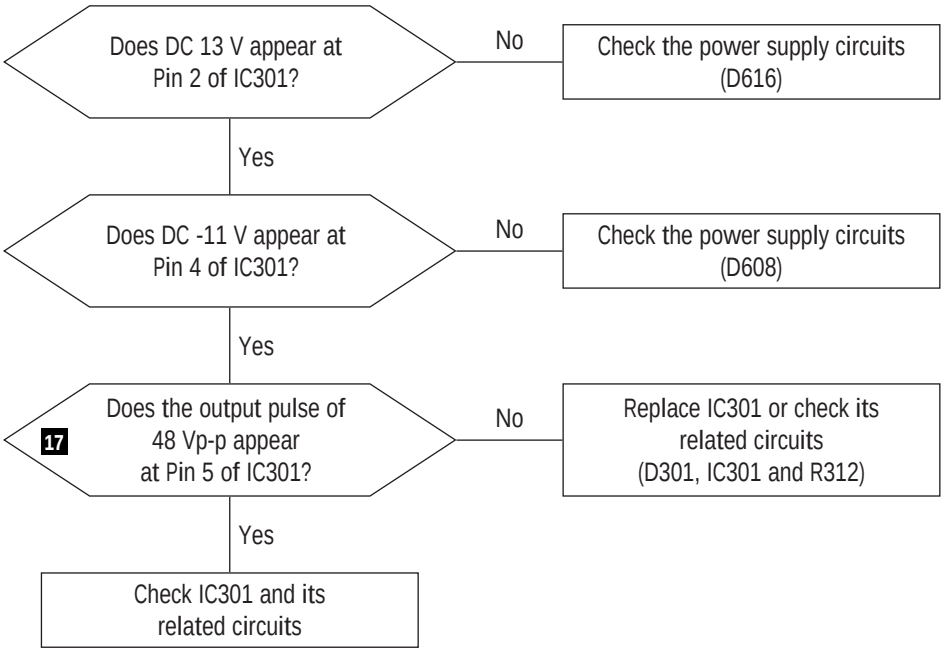
Notes: 1. If a picture does not appear, fully rotate the brightness and contrast controls clockwise and reinspect.

2. Check the following circuits.
   - No raster appears: Power circuit, Horizontal output circuit, H/V control circuit, and H/V output circuit.
   - High voltage develops but no raster appears: Video output circuits.
   - High voltage does not develop: Horizontal output circuits.

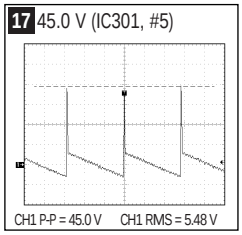
6-1 No Power


Does proper AC 90-264 Volts appear between the positive and negative poles of C604?
No
Check F601, L602 and TH602.
Yes
Check D604~D607, D609, IC602, T601, OP601, and power circuit.

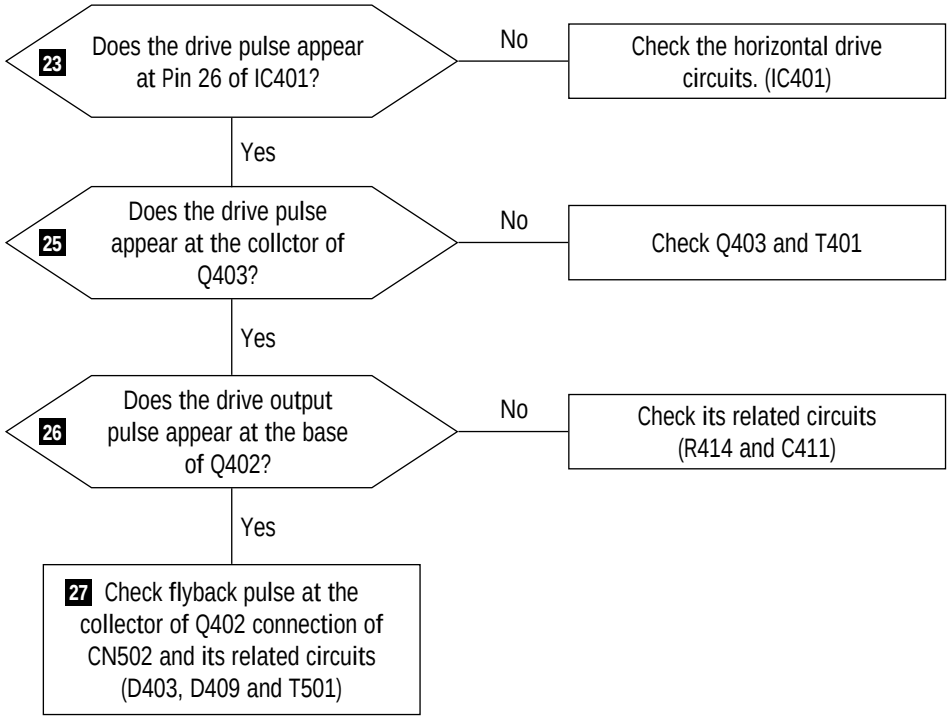
6-2 Horizontal Line on CRT


Does DC 13 V appear at Pin 2 of IC301?
No
Check the power supply circuits (D616)
Yes
Does DC -11 V appear at Pin 4 of IC301?
No
Check the power supply circuits (D608)
Yes
17
Does the output pulse of 48 Vp-p appear at Pin 5 of IC301?
No
Replace IC301 or check its related circuits (D301, IC301 and R312)
Yes
Check IC301 and its related circuits

WAVEFORMS

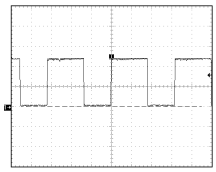


6-3 No Raster

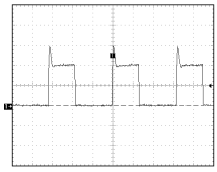

23 Does the drive pulse appear at Pin 26 of IC401?
No
Check the horizontal drive circuits. (IC401)
Yes
25 Does the drive pulse appear at the collctor of Q403?
No
Check Q403 and T401
Yes
26 Does the drive output pulse appear at the base of Q402?
No
Check its related circuits (R414 and C411)
Yes
27 Check flyback pulse at the collector of Q402 connection of CN502 and its related circuits (D403, D409 and T501)

WAVEFORMS

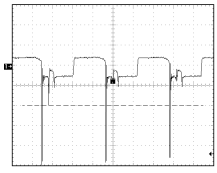
23 4.76 V (IC401, #26)



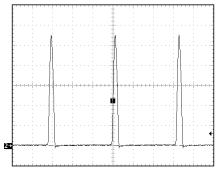
25 29.4 V (Q403, Collector)



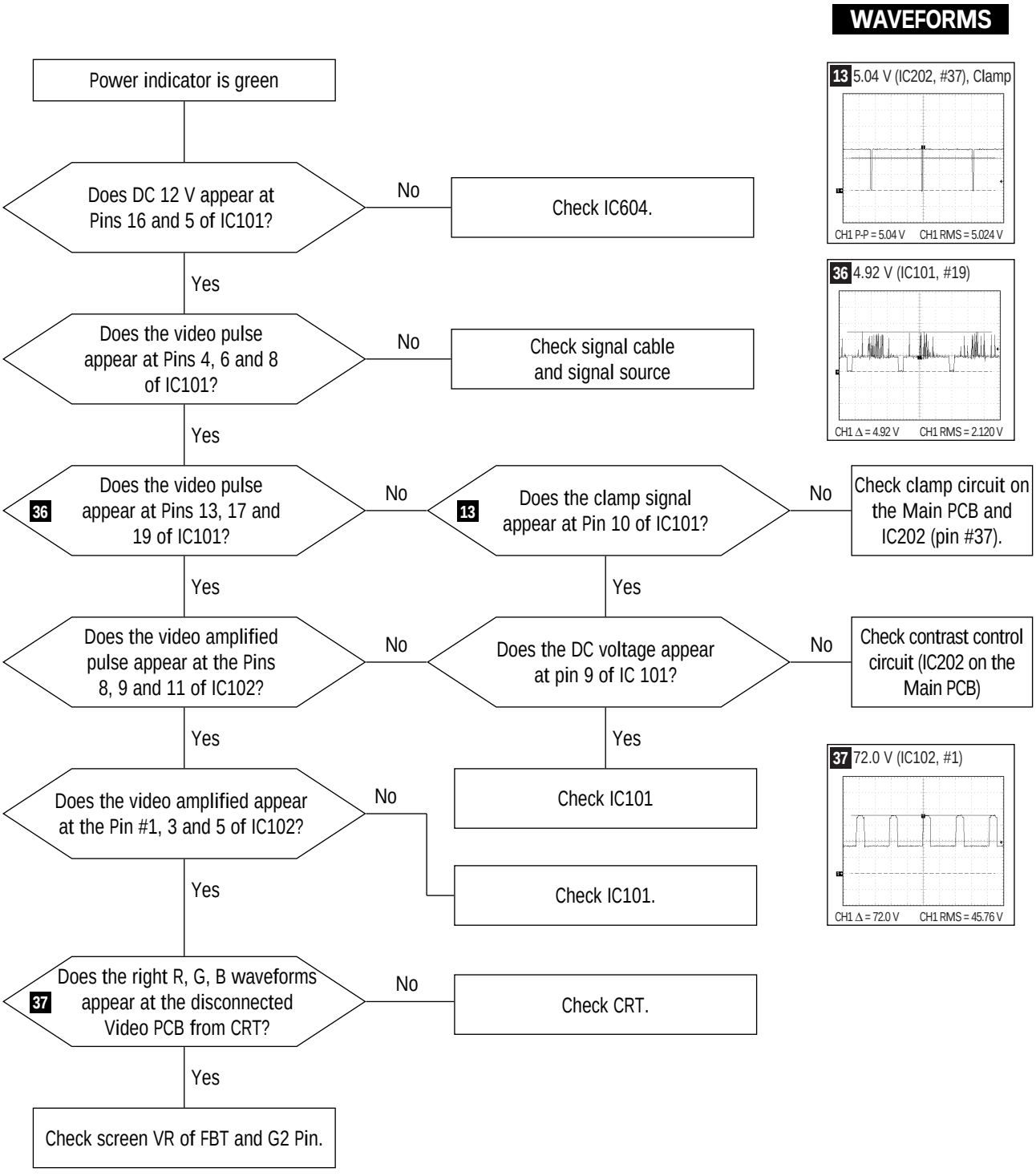
26 10.4 V (Q402, Base)



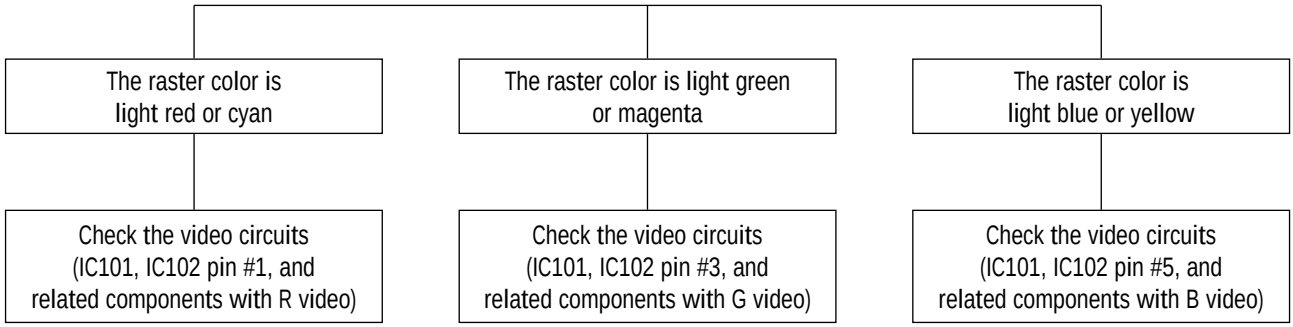
27 1.104 kV (Q402, Collector)



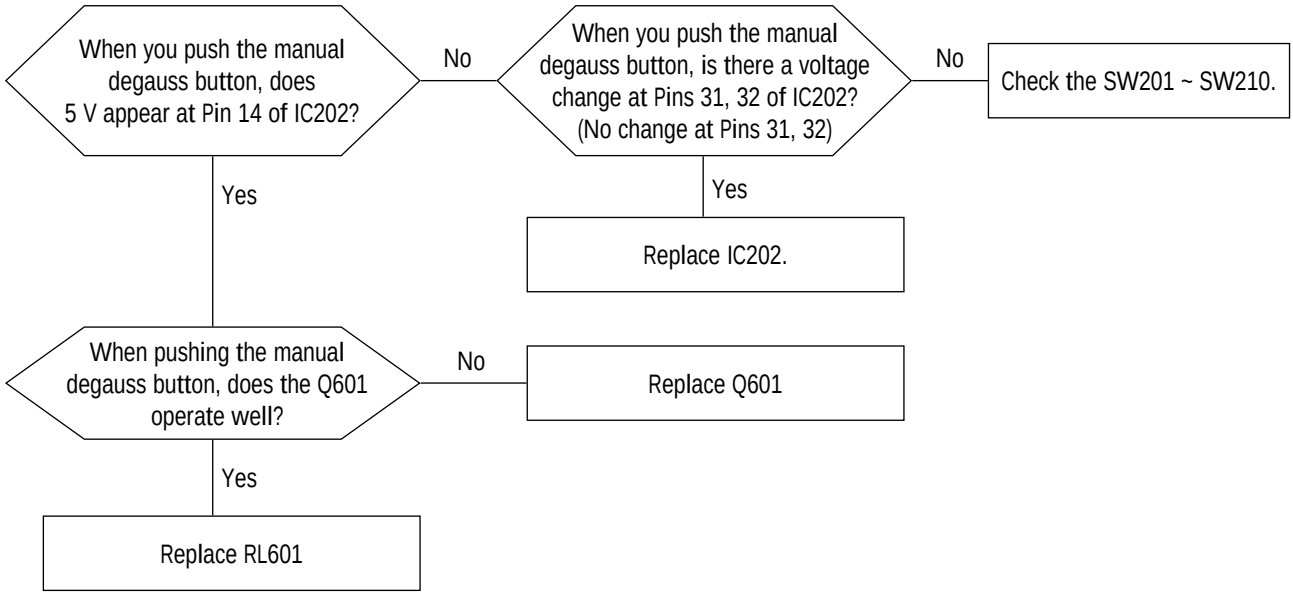
6-4 No Video


WAVEFORMS
Power indicator is green
Does DC 12 V appear at Pins 16 and 5 of IC101?
No
Check IC604.
Yes
Does the video pulse appear at Pins 4, 6 and 8 of IC101?
No
Check signal cable and signal source
Yes
36
Does the video pulse appear at Pins 13, 17 and 19 of IC101?
No
13
Does the clamp signal appear at Pin 10 of IC101?
No
Check clamp circuit on the Main PCB and IC202 (pin #37).
Yes
Yes
Does the video amplified pulse appear at the Pins 8, 9 and 11 of IC102?
No
Does the DC voltage appear at pin 9 of IC 101?
No
Check contrast control circuit (IC202 on the Main PCB)
Yes
Yes
Does the video amplified appear at the Pin #1, 3 and 5 of IC102?
No
Check IC101
Check IC101.
Yes
37
Does the right R, G, B waveforms appear at the disconnected Video PCB from CRT?
No
Check CRT.
Yes
Check screen VR of FBT and G2 Pin.
13 5.04 V (IC202, #37), Clamp
CH1 P-P = 5.04 V
CH1 RMS = 5.024 V
36 4.92 V (IC101, #19)
CH1 Δ = 4.92 V
CH1 RMS = 2.120 V
37 72.0 V (IC102, #1)
CH1 Δ = 72.0 V
CH1 RMS = 45.76 V

6-5 No Specific Color Appears

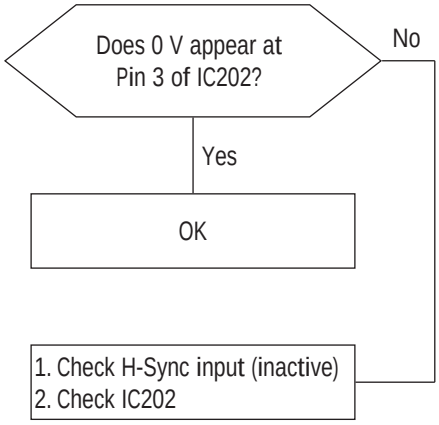

The raster color is light red or cyan
The raster color is light green or magenta
The raster color is light blue or yellow
Check the video circuits (IC101, IC102 pin #1, and related components with R video)
Check the video circuits (IC101, IC102 pin #3, and related components with G video)
Check the video circuits (IC101, IC102 pin #5, and related components with B video)

6-6 Degauss Operation Failure

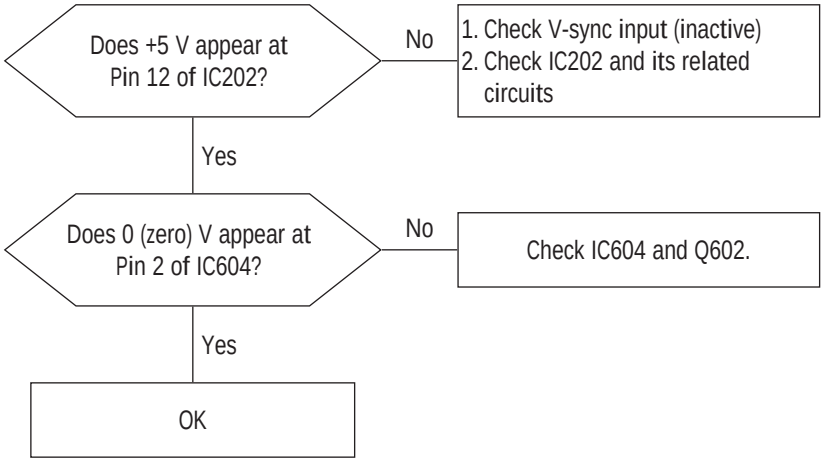

When you push the manual degauss button, does 5 V appear at Pin 14 of IC202?
No
When you push the manual degauss button, is there a voltage change at Pins 31, 32 of IC202? (No change at Pins 31, 32)
No
Check the SW201 ~ SW210.
Yes
Yes
Replace IC202.
When pushing the manual degauss button, does the Q601 operate well?
No
Replace Q601
Yes
Replace RL601

6-7 Power Save Management System Failure

6-7-1 Stand-By Mode



6-7-2 Suspend Mode


Does +5 V appear at Pin 12 of IC202?
No
1. Check V-sync input (inactive)
2. Check IC202 and its related circuits
Yes
Does 0 (zero) V appear at Pin 2 of IC604?
No
Check IC604 and Q602.
Yes
OK

6-7-3 Off Mode

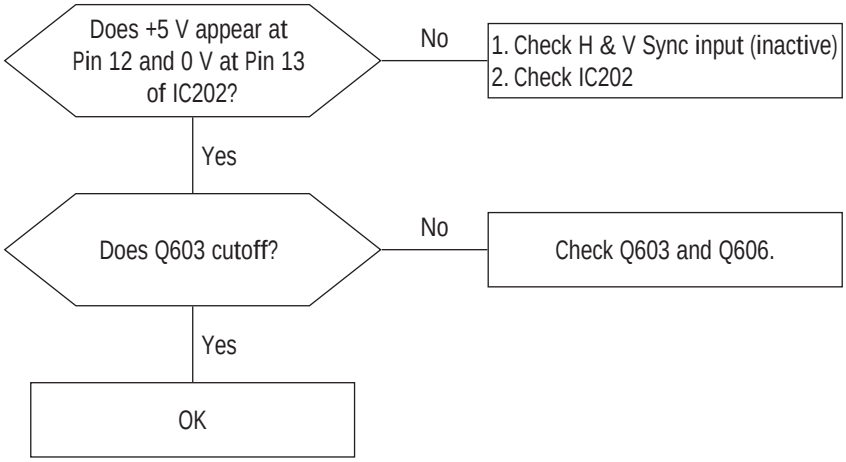


Table 6-1. DPMS Logic Table

Mode	Sync		Video	LED Color
	H	V		
Normal	Active	Active	Active	Green
Stand-By	Inactive	Active	Blank	Green blinking
Suspend	Active	Inactive	Blank	Green blinking
Off	Inactive	Inactive	Blank	Green blinking

Note: If the signal cable is removed, the DPMS function does not operate and a self raster displays.

6-8 User Controls Don't Work

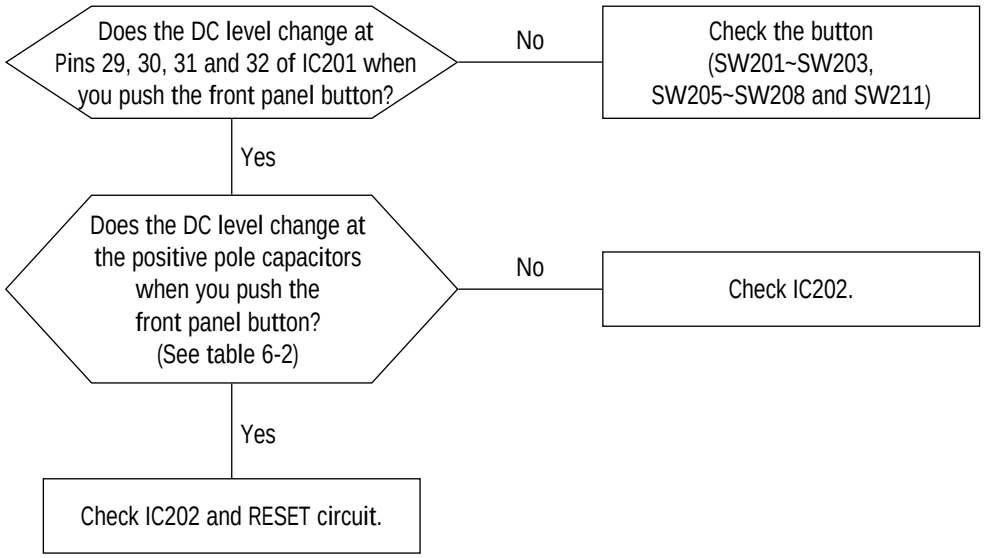
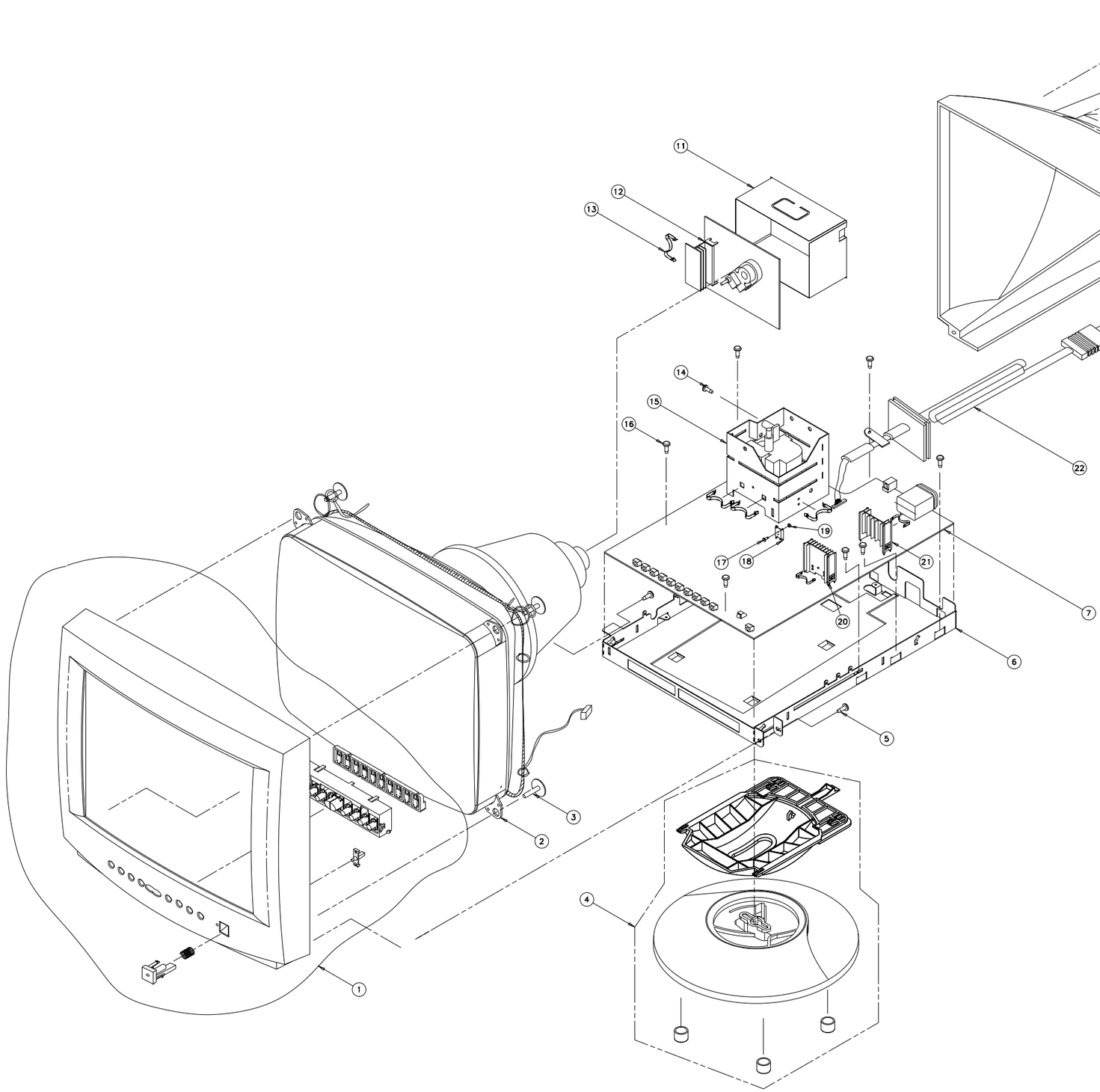

Does the DC level change at Pins 29, 30, 31 and 32 of IC201 when you push the front panel button?
No
Check the button (SW201~SW203, SW205~SW208 and SW211)
Yes
Does the DC level change at the positive pole capacitors when you push the front panel button? (See table 6-2)
No
Check IC202.
Yes
Check IC202 and RESET circuit.

Table 6-2. Front Panel Button

Location	Function
C207 C208 C209	Horizontal Size Contrast Brightness

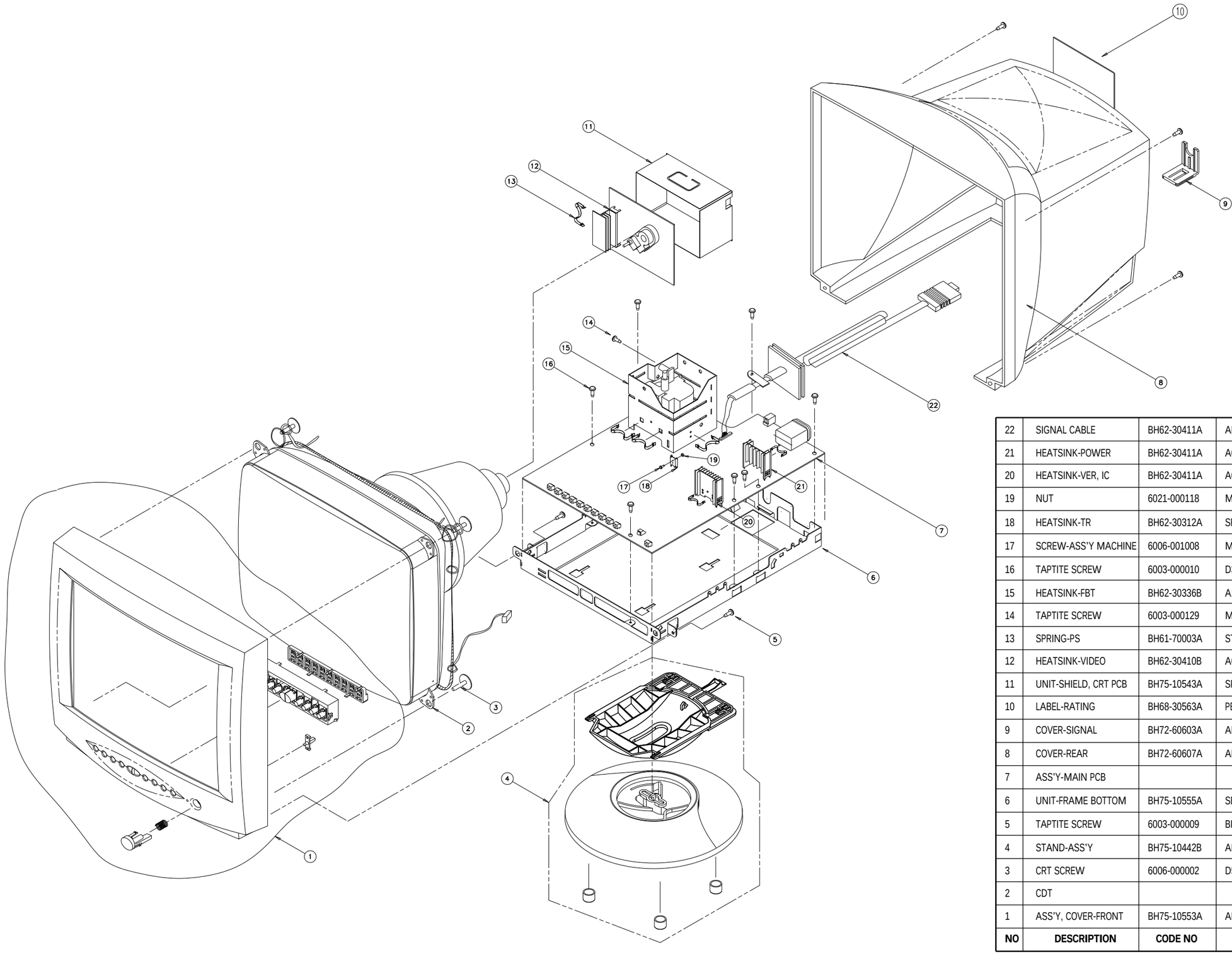
8 Exploded View and Parts List

8-1 CKA4217L



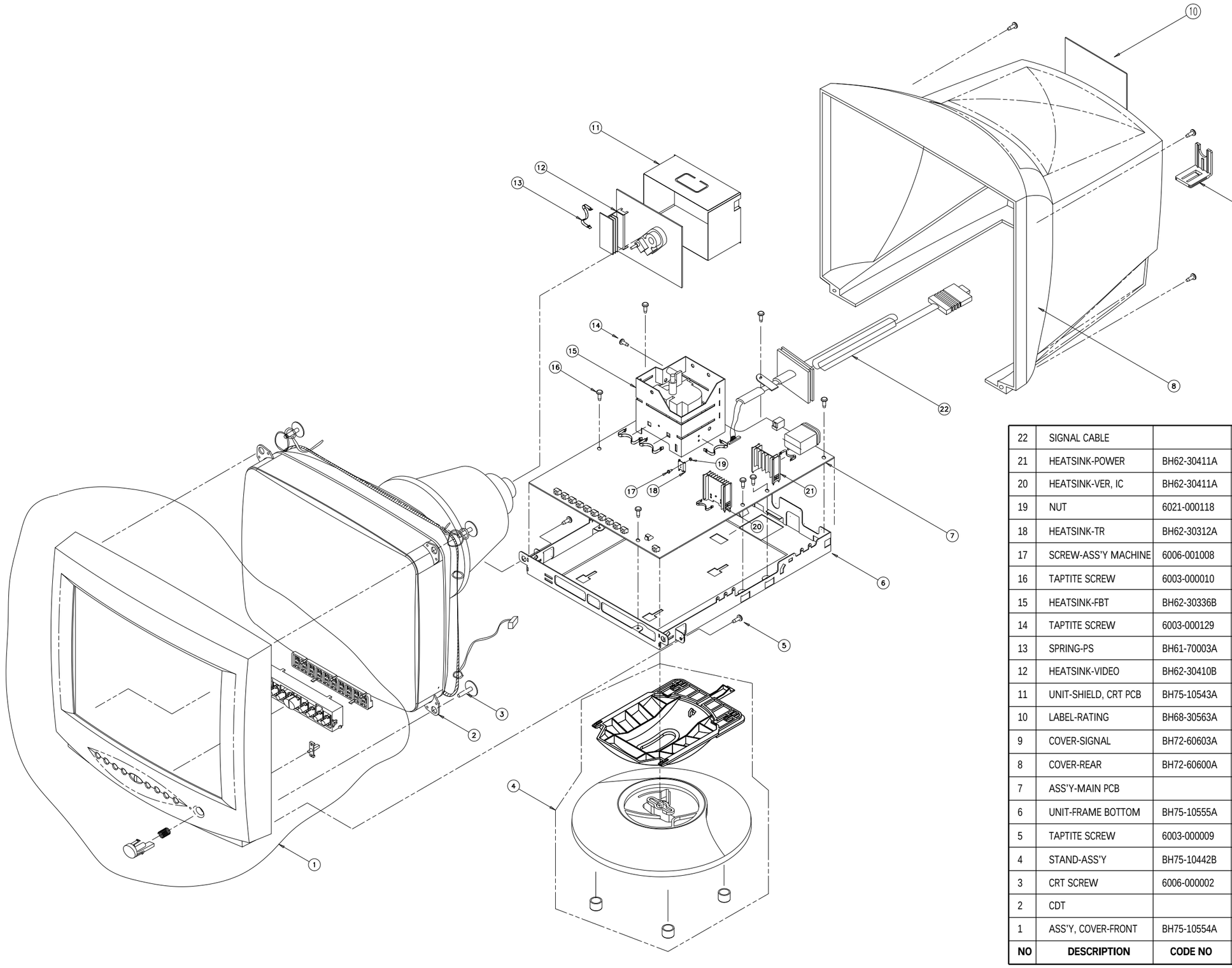
NO	DESCRIPTION	CODE NO	SPECIFICATION	Q'TY	REMARK
22	SIGNAL CABLE			1EA	
21	HEATSINK-POWER	BH62-30411A	A6030S	1EA	
20	HEATSINK-VER, IC	BH62-30411A	A6030S	1EA	
19	NUT	6021-000118	M3, SM20C	1EA	
18	HEATSINK-TR	BH62-30312A	SPC-1, T1.0	1EA	
17	SCREW-ASS'Y MACHINE	6006-001008	M3, L10	1EA	
16	TAPTITE SCREW	6003-000010	D3, L10, W/W	6EA	
15	HEATSINK-FBT	BH62-30336B	A1050S T=1.0	1EA	
14	TAPTITE SCREW	6003-000129	M4,L10,ZPC	1EA	
13	SPRING-PS	BH61-70003A	STS304-W1/2H,T0.5	6EA	
12	HEATSINK-VIDEO	BH62-30410B	A6063S	1EA	
11	UNIT-SHIELD, CRT PCB	BH75-10543A	SPTE T0.3	1EA	
10	LABEL-RATING	BH68-30563A	PE T0.075	1EA	
9	COVER-SIGNAL	BH72-60603A	ABS V0 IV16	1EA	
8	COVER-REAR	BH72-60607A	ABS V0 IV16	1EA	
7	ASS'Y-MAIN PCB			1EA	
6	UNIT-FRAME BOTTOM	BH75-10555A	SECC, T1.0	1EA	
5	TAPTITE SCREW	6003-000009	BH, M4, L16	6EA	
4	STAND-ASS'Y	BH75-10442B	ABS HB IV16	1EA	
3	CRT SCREW	6006-000002	D5,L30,W/CRAMP(D18)	4EA	
2	CDT			1EA	
1	ASS'Y, COVER-FRONT	BH75-10570A	ABS, V0, IV16	1EA	

8-2 CKA4227L



NO	DESCRIPTION	CODE NO	SPECIFICATION	Q'TY	REMARK
22	SIGNAL CABLE	BH62-30411A	ABS, V0, IV16	1EA	
21	HEATSINK-POWER	BH62-30411A	A6030S	1EA	
20	HEATSINK-VER, IC	BH62-30411A	A6030S	1EA	
19	NUT	6021-000118	M3, SM20C	1EA	
18	HEATSINK-TR	BH62-30312A	SPC-1, T1.0	1EA	
17	SCREW-ASS'Y MACHINE	6006-001008	M3, L10	1EA	
16	TAPTITE SCREW	6003-000010	D3, L10, W/W	6EA	
15	HEATSINK-FBT	BH62-30336B	A1050S T=1.0	1EA	
14	TAPTITE SCREW	6003-000129	M4,L10,ZPC	1EA	
13	SPRING-PS	BH61-70003A	STS304-W1/2H,T0.5	6EA	
12	HEATSINK-VIDEO	BH62-30410B	A6063S	1EA	
11	UNIT-SHIELD, CRT PCB	BH75-10543A	SPTE T0.3	1EA	
10	LABEL-RATING	BH68-30563A	PE T0.075	1EA	
9	COVER-SIGNAL	BH72-60603A	ABS V0 IV16	1EA	
8	COVER-REAR	BH72-60607A	ABS V0 IV16	1EA	
7	ASS'Y-MAIN PCB			1EA	
6	UNIT-FRAME BOTTOM	BH75-10555A	SECC, T1.0	1EA	
5	TAPTITE SCREW	6003-000009	BH, M4, L16	6EA	
4	STAND-ASS'Y	BH75-10442B	ABS HB IV16	1EA	
3	CRT SCREW	6006-000002	D5,L30,W/CRAMP(D18)	4EA	
2	CDT			1EA	
1	ASS'Y, COVER-FRONT	BH75-10553A	ABS, V0, IV16	1EA	

8-3 CKA5227L



NO	DESCRIPTION	CODE NO	SPECIFICATION	Q'TY	REMARK
22	SIGNAL CABLE			1EA	
21	HEATSINK-POWER	BH62-30411A	A6030S	1EA	
20	HEATSINK-VER, IC	BH62-30411A	A6030S	1EA	
19	NUT	6021-000118	M3, SM20C	1EA	
18	HEATSINK-TR	BH62-30312A	SPC-1, T1.0	1EA	
17	SCREW-ASS'Y MACHINE	6006-001008	M3, L10	1EA	
16	TAPTITE SCREW	6003-000010	D3, L10, W/W	6EA	
15	HEATSINK-FBT	BH62-30336B	A1050S T=1.0	1EA	
14	TAPTITE SCREW	6003-000129	M4,L10,ZPC	1EA	
13	SPRING-PS	BH61-70003A	STS304-W1/2H,T0.5	6EA	
12	HEATSINK-VIDEO	BH62-30410B	A6063S	1EA	
11	UNIT-SHIELD, CRT PCB	BH75-10543A	SPTE T0.3	1EA	
10	LABEL-RATING	BH68-30563A	PE T0.075	1EA	
9	COVER-SIGNAL	BH72-60603A	ABS V0 IV16	1EA	
8	COVER-REAR	BH72-60600A	ABS V0 IV16	1EA	
7	ASS'Y-MAIN PCB			1EA	
6	UNIT-FRAME BOTTOM	BH75-10555A	SECC, T1.0	1EA	
5	TAPTITE SCREW	6003-000009	BH, M4, L16	6EA	
4	STAND-ASS'Y	BH75-10442B	ABS HB IV16	1EA	
3	CRT SCREW	6006-000002	D5,L30,W/CRAMP(D18)	4EA	
2	CDT			1EA	
1	ASS'Y, COVER-FRONT	BH75-10554A	ABS, V0, IV16	1EA	

Memo

10-1-3 Main PCB Parts

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
BD101	306	167.8	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD102	252	157.5	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD103	252.5	230	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD104	254	197	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD105	302.8	154.5	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD401	32.5	157	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD402	134.8	198.5	3301-000012	CORE-FERRITE BEAD	AA,3.5x1x9mm,1000,3000G	
BD403	73	146.8	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD404	128	208	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD502	98.5	136.8	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD602	175.8	90.5	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD603	222.3	41	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	⚠
BD604	180	72	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD605	279.5	49.3	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD608	296.5	31	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD609	190	121.5	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD610	318	36	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD611	220.3	44	3301-000012	CORE-FERRITE BEAD	AA,3.5x1x9mm,1000,3000G	
C101B	300.8	137	2401-000028	C-AL	10uF,20%,50V,GP,5x11mm,5mm,TP	
C101G	294.8	137	2401-000028	C-AL	10uF,20%,50V,GP,5x11mm,5mm,TP	
C101R	278.3	137	2401-000028	C-AL	10uF,20%,50V,GP,5x11mm,5mm,TP	
C102B	317.8	142.5	2202-002008	C-CERAMIC,MLC-AXIAL	10nF,+80-20%,50V,Y5V,2.3X3.0	
C102G	317.8	148	2202-002008	C-CERAMIC,MLC-AXIAL	10nF,+80-20%,50V,Y5V,2.3X3.0	
C102R	317.8	153.5	2202-002008	C-CERAMIC,MLC-AXIAL	10nF,+80-20%,50V,Y5V,2.3X3.0	
C103B	294.3	205.5	2301-000010	CAP-MYLAR,104J,2A,5P	(T)100V 104J	
C103G	284	205.5	2301-000010	CAP-MYLAR,104J,2A,5P	(T)100V 104J	
C103R	304	232.5	2301-000010	CAP-MYLAR,104J,2A,5P	(T)100V 104J	
C104B	318.5	187	2401-000043	C-AL	1uF,20%,160V,GP,6.3x11mm,5mm,T	
C104G	317	202	2401-000043	C-AL	1uF,20%,160V,GP,6.3x11mm,5mm,T	
C104R	316.5	220.8	2401-000043	C-AL	1uF,20%,160V,GP,6.3x11mm,5mm,T	
C110	253.3	222	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C111	252.5	237.5	2401-000042	C-AL	100uF,20%,16V,GP,6.3x7mm,2.5mm	
C112	249.5	186.5	2301-000010	CAP-MYLAR,104J,2A,5P	(T)100V 104J	
C113	249.8	201.3	2401-000033	C-AL	100uF,20%,100V,GP,13x20mm,5mm	
C114	269.8	153	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C115	280.8	153	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C116	285	157.5	2401-000042	C-AL	100uF,20%,16V,GP,6.3x7mm,2.5mm	
C117	275.3	153	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C118	316	164	2201-000526	C-CERAMIC,DISC	4.7nF,10%,1KV,Y5P,5x4,10,BK	
C119	265	166.5	2201-000019	CAP-CERAMIC,103Z,2H,DISC	10NF,500V,80-20%,Y5V,RADIAL	
C120	296.5	152	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C121	289	152	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C122	306	154.5	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C123	282.8	138.5	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C124	287	137	2401-000042	C-AL	100uF,20%,16V,GP,6.3x7mm,2.5mm	
C125	253.5	191	2201-000021	C-CERAMIC,DISC	100nF,+80-20%,50V,Y5V,8x3,5,TP	
C126	263.5	145.3	2401-000023	CAP-AL.ELEC,105M,1H	(T)50V 1M	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
C127	305.3	141.5	2401-000023	CAP-AL.ELEC,105M,1H	(T)50V 1M	
C129	266.5	146	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C201	36	41	2401-001166	CAP-AL.ELEC,336M,1C	(T)16V 33M	
C202	36.3	27	2202-002008	C-CERAMIC,MLC-AXIAL	10nF,+80-20%,50V,Y5V,2.3X3.0	
C203	30	71	2201-000017	C-CERAMIC,DISC	1nF,10%,50V,Y5P,4x3.5,5,TP	
C204	30	67.5	2201-000146	C-CERAMIC,DISC	100pF,5%,50V,SL,5x3.5,5,TP	
C205	46.8	36.5	2201-000011	C-CERAMIC,DISC	47pF,5%,50V,NPO,6.5x3.0,5,TP	
C206	41.8	36.5	2201-000011	C-CERAMIC,DISC	47pF,5%,50V,NPO,6.5x3.0,5,TP	
C207	19	47.3	2401-000050	C-AL	10uF,20%,16V,GP,5x11mm,2mm,TP	
C208	28	31.3	2401-000023	CAP-AL.ELEC,105M,1H	(T)50V 1M	
C209	19	40	2401-000023	CAP-AL.ELEC,105M,1H	(T)50V 1M	
C210	71.8	43	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C211	75	43	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C212	79.5	64.5	2401-000023	CAP-AL.ELEC,105M,1H	(T)50V 1M	
C213	43.8	17	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C214	66	14.5	2401-000050	C-AL	10uF,20%,16V,GP,5x11mm,2mm,TP	
C215	68.5	17	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C216	71	108.5	2401-000050	C-AL	10uF,20%,16V,GP,5x11mm,2mm,TP	
C217	65	109.5	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C219	210.5	102.3	2201-000011	C-CERAMIC,DISC	47pF,5%,50V,NPO,6.5x3.0,5,TP	
C220	77.8	85.8	2401-000050	C-AL	10uF,20%,16V,GP,5x11mm,2mm,TP	
C221	14	57.3	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C222	41.5	88.3	2401-000023	CAP-AL.ELEC,105M,1H	(T)50V 1M	
C301	109	89.5	2305-001009	C-FILM,MPEF	39nF,5%,250V,13x9x4.5mm,7.5mm	
C304	107	74	2401-000023	CAP-AL.ELEC,105M,1H	(T)50V 1M	
C305	106.5	41.8	2305-000280	CAP-MPETP,224K,1J,5P	(T)63V 224K	
C306	141	22.8	2401-000037	CAP-AL.ELEC,477M,1	(T)470UF,16V,20%C,8x11.5,R-RADIAL	
C307	106	66.3	2401-000849	CAP-AL.ELEC,227M,1V	(T)35V 220M	
C308	126	10.5	2401-000037	CAP-AL.ELEC,477M,1C	(T)470UF,16V,20%C,8x11.5,R-RADIAL	
C309	102.5	54	2201-000013	C-CERAMIC,DISC	470pF,10%,50V,Y5P,4x3.5,5,TP	
C310	106.5	56	2301-000228	C-FILM,PEF	3.3nF,10%,100V,5.8x12.5mm,5mm	
C311	101.5	47.8	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C312	92.8	19.5	2305-000001	C-FILM,MPEF	470nF,10%,63V,6.0X15.5X7.5,5mm	
C313	125.5	27	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C314	130	44.5	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C401	52	138.5	2401-000027	C-AL	4.7uF,20%,50V,GP,5x11mm,5mm,TP	
C403	52	130	2301-000015	C-FILM,PEF	10nF,5%,100V,7x3.2x7mm,5mm,TP	
C404	63	142.3	2401-000031	C-AL	47uF,20%,16V,GP,6.3x11mm,5mm,T	
C405	63.5	134.3	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C406	56.3	137.3	2301-000257	C-FILM,PEF	4.7nF,10%,100V,5.8x12.5mm,5mm	
C407	69	142.5	2201-000471	C-CERAMIC,DISC	330pF,10%,50V,Y5P,4x3.5,5,TP	
C408	43.8	138	2301-000016	C-FILM,PEF	22nF,5%,100V,7.2x4.5x9.0mm,5mm	
C409	53.3	143	2202-002026	C-CERAMIC,MLC-RADIAL	1nF,5%,50V,X7R,TP,5.1x6.4x3.2	
C410	83.8	224.3	2201-000291	C-CERAMIC,DISC	1nF,10%,500V,Y5P,8.5x5MM,5,TP	
C411	100.5	229.8	2401-000876	CAP-AL.ELEC,227M,1H	(T)50V 220M	
C412	83	199	2401-000048	CAP-AL.ELEC,476M,1E	(T)25V 47M	
C413	62.8	178.5	2301-000012	CAP-MYLAR,222J,2A,5P	(T)100V 222J	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
C414	108	236	2303-000305	C-FILM,PPF	3nF,5%,1.6KV,29x13.5x8mm,25mm	⚠
C415	114.5	236	2303-000305	C-FILM,PPF	3nF,5%,1.6KV,29x13.5x8mm,25mm	⚠
C416	62	230.5	2305-000179	C-FILM,MPEF	10nF,5%,250V,14.5x8.8mm,10mm,B	
C417	132.8	229	2301-000133	C-FILM,PEF	10nF,10%,100V,6.5x12.5mm,5mm,T	
C420	48	180.5	2401-000023	CAP-AL.ELEC,105M,1H	(T)50V 1M	
C421	75	137.5	2201-000643	C-CERAMIC,DISC	680pF,10%,50V,Y5P,4x3.5,5,TP	
C422	43	218	2306-000171	C-FILM, MPPF	270nF,5%,250V,21.5x12.5mm,7.5mm	14”
			2306-000137	C-FILM, MPPF	180nF,5%,250V,19x16.5x8mm,7.5mm	15” SDD
			2306-000171	C-FILM, MPPF	270nF,5%,250V,21.5x12.5mm,7.5mm	15” Philips
C423	53.5	211	2306-000007	C-FILM,MPPF	470nF,5%,250V,26.5x14mm,22.5mm	15” Philips
			2306-000249	C-FILM,MPPF	680nF,5%,250V,26x20.5x12mm,20mm	14”
			2306-000197	C-FILM,MPPF	390nF,5%,250V,20x19x12mm,17.5mm	15” SDD
C424	33.5	211	2306-000234	C-FILM,MPPF	560nF,5%,250V,26.5x15mm,22.5mm	15” Philips
			2306-000249	C-FILM,MPPF	680nF,5%,250V,26x20.5x12mm,20mm	14”
			2301-001159	C-FILM,MPPF	540nF,5%,250V	15” SDD
C425	33	161.5	2401-000042	C-AL	100uF,20%,16V,GP,6.3x7mm,2.5mm	
C426	36.5	163	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C427	60	167.5	2301-000168	C-FILM,PEF	150nF,5%,100V,11.5x19mm,7.5mm	
C428	26	222.5	2401-000023	CAP-AL.ELEC,105M,1H	(T)50V 1M	
C429	15.5	222.5	2401-000023	CAP-AL.ELEC,105M,1H	(T)50V 1M	
C430	61.5	161.5	2305-000001	C-FILM,MPEF	470nF,10%,63V,6.0X15.5X7.5,5mm	
C431	33	168.8	2401-000042	C-AL	100uF,20%,16V,GP,6.3x7mm,2.5mm	
C432	39.5	163	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C433	69.5	169	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C434	73.5	168.8	2401-001509	C-AL	47uF,20%,16V,GP,6.3x7mm,2.5mm	
C435	152.5	117	2401-001012	C-ALUMINUM	3.3UF,20%,50V,BP,16+26.7,7.5mm,T	
C436	129	188	2303-001029	C-FILM,PPF	5.2nF,5%,630V,19x7x13,7.5,TP	
C437	155.5	147	2301-000012	CAP-MYLAR,222J,2A,5P	(T)100V 222J	
C439	154	137.8	2201-000010	CAP-CERAMIC,330J,1H,NPO	33PF,50V,5%,NPOPPM,NPO,DISC	
C440	80.5	134.5	2301-000016	C-FILM,PEF	22nF,5%,100V,7.2x4.5x9.0mm,5mm	
C441	185	135.5	2301-000012	CAP-MYLAR,222J,2A,5P	(T)100V 222J	
C442	84	116	2201-000326	C-CERAMIC,DISC	2.2nF,10%,50V,Y5P,6.3X3.0,5,TP	
C443	36	141.5	2301-000016	C-FILM,PEF	22nF,5%,100V,7.2x4.5x9.0mm,5mm	
C445	50.8	171.8	2401-000050	C-AL	10uF,20%,16V,GP,5x11mm,2mm,TP	
C501	92.5	168.5	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C502	98.8	150	2401-000966	C-AL	22uF,20%,50V,GP,6.3x11mm,5mm,T	
C503	170.5	119.5	2305-000004	C-FILM,MPEF	220nF,10%,100V,12.7x16,5mm,TP	
C504	85.5	174.5	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C505	170.5	126	2305-000004	C-FILM,MPEF	220nF,10%,100V,12.7x16,5mm,TP	
C507	219	205.3	2201-000017	C-CERAMIC,DISC	1nF,10%,50V,Y5P,4x3.5,5,TP	
C508	207.5	144.5	2401-000046	CAP-AL.ELEC,106M,2E	(T)250V 10M	
C509	203.5	241	2401-001334	C-AL	470nF,20%,50V,GP,5x11mm,2mm,TP	
C511	117.5	149	2201-000469	C-CERAMIC,DISC	330pF,10%,500V,Y5P,6x3.5,5,TP	
C512	130	137.5	2306-000007	C-FILM,MPPF	470nF,5%,250V,26.5x14mm,22.5mm	
C515	186.8	125.8	2201-000017	C-CERAMIC,DISC	1nF,10%,50V,Y5P,4x3.5,5,TP	
C516	186.8	129.5	2201-000471	C-CERAMIC,DISC	330pF,10%,50V,Y5P,4x3.5,5,TP	
C517	140	91	2401-000033	C-AL	100uF,20%,100V,GP,13x20mm,5mm	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
C518	175	139	2401-000027	C-AL	4.7uF,20%,50V,GP,5x11mm,5mm,TP	
C519	235.3	162.3	2401-000010	C-AL	220uF,20%,16V,GP,6.3x11mm,2.5m	
C520	215.5	224.8	2202-002008	C-CERAMIC,MLC-AXIAL	10nF,+80-20%,50V,Y5V,2.3X3.0	
C601	60	11	2401-000037	CAP-AL.ELEC,477M,1C	(T)470UF,16V,20%C,8x11.5,R-RADIAL	
C602	51	18.3	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C604	282.5	45.3	2201-000024	C-CERAMIC,DISC	4.7nF,20%,250VAC,Y5U,16x7,7.5	⚠
C605	269	45.3	2201-000024	C-CERAMIC,DISC	4.7nF,20%,250VAC,Y5U,16x7,7.5	⚠
C606	267.5	36.5	2501-000203	CAP-MPAPER,474K,250VAC	470NF,250VAC,10%,X2,RE-RAD	⚠
C607	296.3	16.5	2201-000024	C-CERAMIC,DISC	4.7nF,20%,250VAC,Y5U,16x7,7.5	⚠
C608	290	19	2201-000024	C-CERAMIC,DISC	4.7nF,20%,250VAC,Y5U,16x7,7.5	⚠
C610	168	14	2301-000012	CAP-MYLAR,222J,2A,5P	(T)100V 222J	
C611	177.5	24	2301-000287	CAP-MYLAR,562J,2A,5P	(T)100V 562J	
C612	163.5	83.5	2401-000033	C-AL	100uF,20%,100V,GP,13x20mm,5mm	
C613	226	15.5	2301-000018	C-FILM,PEF	47nF,5%,100V,8.5x12.5mm,5mm,TP	
C614	220.5	15.5	2305-000004	C-FILM,MPEF	220nF,10%,100V,12.7x16,5mm,TP	
C615	162.5	23	2401-000039	CAP-AL.ELEC,108M.1C,10x16	(T)1000UF,16V,20%,R-RADIAL	
C616	169.5	28	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C617	245.8	91.8	2401-000052	CAP-AL.ELE,227M,2G,30X35	(B)220UF,400V,20%,R-RADIAL	⚠
C618	255.8	16.6	2201-000020	C-CERAMIC,DISC	10nF,10%,1KV,Y5P,20x5,10,BK	
C619	150	28.5	2201-000016	C-CERAMIC,DISC	2.2nF,10%,500V,Y5P,8x4,5,TP	
C620	147	37.5	2401-000033	C-AL	100uF,20%,100V,GP,13x20mm,5mm	
C621	162.5	59.5	2201-000291	C-CERAMIC,DISC	1nF,10%,500V,Y5P,8.5x5MM,5,TP	
C622	160	68	2401-000038	C-AL	470uF,20%,25V,GP,10x12.5mm,5mm	
C623	251.5	64	2401-001195	CAP-AL.ELEC,336M,1H	(T)50V 33M	
C624	251.8	48.5	2301-000010	CAP-MYLAR,104J,2A,5P	(T)100V 104J	
C625	251.5	36.8	2201-000365	C-CERAMIC,DISC	220pF,10%,2KV,Y5P,6.3X3.0,5,TP	
C626	233.3	72.3	2401-000023	CAP-AL.ELEC,105M,1H	(T)50V 1M	
C627	176	52.5	2401-000039	CAP-AL.ELEC,108M.1C,10x16	(T)1000UF,16V,20%,R-RADIAL	
C628	28.3	177.3	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C629	48	187.3	2401-000042	C-AL	100uF,20%,16V,GP,6.3x7mm,2.5mm	
C630	202.8	72	2201-000024	C-CERAMIC,DISC	4.7nF,20%,250VAC,Y5U,16x7,7.5	
C631	196.5	79.3	2201-000024	C-CERAMIC,DISC	4.7nF,20%,250VAC,Y5U,16x7,7.5	
C632	159.5	41.5	2401-000039	CAP-AL.ELEC,108M.1C,10x16	(T)1000UF,16V,20%,R-RADIAL	
C633	147.5	59.5	2401-000031	C-AL	47uF,20%,16V,GP,6.3x11mm,5mm,T	
C634	219.5	71	2301-000010	CAP-MYLAR,104J,2A,5P	(T)100V 104J	
C636	168	47	2201-000469	C-CERAMIC,DISC	330pF,10%,500V,Y5P,6x3.5,5,TP	
CN101	247	134	3711-003240	CONNECTOR-HEADER	BOX,15P,1R,2.5mm,STRAIGHT,SN	
CN102	265	179.5	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN103	323	165	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN201	224	115.8	3711-003594	CONNECTOR-HEADER	BOX,13P,1R,2mm,STRAIGHT,SN	
CN202	224	124.3	3711-003240	CONNECTOR-HEADER	BOX,15P,1R,2.5mm,STRAIGHT,SN	
CN301	118.5	184.5	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN302	118.5	176.5	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN303	91.5	13.5	3711-000024	CONNECTOR-HEADER	BOX,3P,1R,2.5mm,STRAIGHT,SN	
CN502	118.5	203	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN503	118.5	192.5	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN504	185	238	3711-000024	CONNECTOR-HEADER	BOX,3P,1R,2.5mm,STRAIGHT,SN	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
CN601	305	97	3711-000217	CON-WALL HEADER,3P,3.96	STRAIGHT,1WALL	
CN602	272.5	77	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN603	265	77	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN604	311.5	74.8	3722-001100	JACK-DIN	4P/2C,6mm,AG,BLK,NO	
CN606	300.3	82	3711-000178	CONNECTOR-HEADER	1WALL,2P,1R,3.96mm,STRAIGHT,SN	
CRT1	282.8	188	BH03-10301G	CRT,COLOR,14	M34KUK35X01	
D101	258.5	153	0402-000007	DIODE-REC,1N4937,DO-41	420V,1A,1.2V,1A,200NS,1A	
D101B	274	219.5	0401-000006	DIODE-SWITCHING	BAV21,200V,250mA,400mW,50nS,DO	
D101G	269	219.5	0401-000006	DIODE-SWITCHING	BAV21,200V,250mA,400mW,50nS,DO	
D101R	266.5	219.5	0401-000006	DIODE-SWITCHING	BAV21,200V,250mA,400mW,50nS,DO	
D102B	281.5	230.5	0401-000006	DIODE-SWITCHING	BAV21,200V,250mA,400mW,50nS,DO	
D102G	286.5	230.5	0401-000006	DIODE-SWITCHING	BAV21,200V,250mA,400mW,50nS,DO	
D102R	291.5	230.5	0401-000006	DIODE-SWITCHING	BAV21,200V,250mA,400mW,50nS,DO	
D103B	313.5	194	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D103G	312	210.3	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D103R	313.3	230.8	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D205	228.5	130	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D206	231	130	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D207	233.5	130	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D208	237.5	126.5	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D209	237.5	124	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D210	237.5	121.5	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D211	214.5	109.5	0403-000005	DIODE-ZEN,UZ-5.1B,DO-35	0.5W,10MA	
D213	227.5	107	0403-000005	DIODE-ZEN,UZ-5.1B,DO-35	0.5W,10MA	
D214	259.5	117.3	0403-000005	DIODE-ZEN,UZ-5.1B,DO-35	0.5W,10MA	
D215	259.5	114.8	0403-000005	DIODE-ZEN,UZ-5.1B,DO-35	0.5W,10MA	
D216	66.5	134.3	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D301	130.5	41	0402-000128	DIODE-REC,1N4002,DO-41	70V,1A,1.1V,1A,2000NS,0.5A	
D401	80	230	0402-000007	DIODE-REC,1N4937,DO-41	420V,1A,1.2V,1A,200NS,1A	
D402	72.5	232.1	0401-000006	DIODE-SWITCHING	BAV21,200V,250mA,400mW,50nS,DO	
D403	135.5	207.8	0404-000001	DIODE-SCHOTTKY	FMP-G2FS,1500V,5A,TO-220,ST	
D404	66.5	221.3	0401-000006	DIODE-SWITCHING	BAV21,200V,250mA,400mW,50nS,DO	
D405	71.3	178.8	0402-000128	DIODE-REC,1N4002,DO-41	70V,1A,1.1V,1A,2000NS,0.5A	
D406	26.5	206	0402-000006	DIODE-RECTIFIER	1N4007GP,1000V,1A,DO-41	
D407	16	206	0402-000006	DIODE-RECTIFIER	1N4007GP,1000V,1A,DO-41	
D408	121	232	0402-001112	DIODE-RECTIFIER	MDV04-600,600V,4A,DO201,BK	
D409	127.3	234.3	0402-001025	DIODE-RECTIFIER	ERD07-15,1500V,1.5A	
D410	40.5	139	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D411	61	188.5	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D412	61	134.3	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D413	58.5	126.3	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D414	138.5	186.5	0402-000007	DIODE-REC,1N4937,DO-41	420V,1A,1.2V,1A,200NS,1A	
D418	58.3	206.5	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D501	116	133.5	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D502	187	120.3	0401-000006	DIODE-SWITCHING	BAV21,200V,250mA,400mW,50nS,DO	
D503	187	122.8	0401-000006	DIODE-SWITCHING	BAV21,200V,250mA,400mW,50nS,DO	
D507	213	155.5	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
D509	210.5	155.5	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D510	225.8	173.8	0402-000006	DIODE-RECTIFIER	1N4007GP,1000V,1A,DO-41	
D513	212.8	137.8	0401-000006	DIODE-SWITCHING	BAV21,200V,250mA,400mW,50nS,DO	
D514	176.5	232.5	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D515	118.5	152.5	0402-000014	DIODE-RECTIFIER	RG2,400V,1.2A,DO-201	
D516	197	135	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D517	190	125	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D518	203.5	231.5	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D519	95	157.8	0403-000337	DIODE-ZENER	UZ24BH,24V,24.2-25.7V,500mW,DO	
D602	286	117	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D603	220.5	18.5	0403-000351	AM DIODE-ZEN,UZ-4.7B	ST 02169-403-420	
D604	292.3	79	0402-000008	DIODE-REC,1N5399GP,DO-15	1000V,1.4V,1.5A,2US	
D605	260	58	0402-000008	DIODE-REC,1N5399GP,DO-15	1000V,1.4V,1.5A,2US	
D606	260	51.3	0402-000008	DIODE-REC,1N5399GP,DO-15	1000V,1.4V,1.5A,2US	
D607	288	74.8	0402-000008	DIODE-REC,1N5399GP,DO-15	1000V,1.4V,1.5A,2US	
D608	173	28	0402-000007	DIODE-REC,1N4937,DO-41	420V,1A,1.2V,1A,200NS,1A	
D609	271	64	0402-000008	DIODE-REC,1N5399GP,DO-15	1000V,1.4V,1.5A,2US	
D610	169.5	31.5	0402-000007	DIODE-REC,1N4937,DO-41	420V,1A,1.2V,1A,200NS,1A	
D611	185	31.5	0402-000007	DIODE-REC,1N4937,DO-41	420V,1A,1.2V,1A,200NS,1A	
D612	186	68.3	0402-000005	DIODE-RECTIFIER	31DF4,400V,3A,DO-201AD	
D613	222.3	33.8	0402-000017	DIODE-RECTIFIER	RGP02-12,1200V,0.5A,DO-204AL	
D614	222.5	53	0402-000007	DIODE-REC,1N4937,DO-41	420V,1A,1.2V,1A,200NS,1A	
D615	186	62.8	0402-000005	DIODE-RECTIFIER	31DF4,400V,3A,DO-201AD	
D616	185.5	36.5	0402-000014	DIODE-RECTIFIER	RG2,400V,1.2A,DO-201	
D617	182.5	41.5	0402-000247	DIODE-RECTIFIER	RG2Y,70V,1.5A,DO-201	
D618	231	79.5	0401-000005	DIODE-SIG,1N4148,DO-35	75V,150MA,1V,10MA	
D619	256.8	44.8	0402-000017	DIODE-RECTIFIER	RGP02-12,1200V,0.5A,DO-204AL	
D620	167	57.5	0402-000007	DIODE-REC,1N4937,DO-41	420V,1A,1.2V,1A,200NS,1A	
EY101	298.4	229.6	6042-000001	EYELET	EYELET 2.2 HOLE 3.0 PAD 5.0	
EY102	247.6	229.6	6042-000001	EYELET	EYELET 2.2 HOLE 3.0 PAD 5.0	
EY103	247.6	211.4	6042-000001	EYELET	EYELET 2.2 HOLE 3.0 PAD 5.0	
EY104	298.4	211.4	6042-000001	EYELET	EYELET 2.2 HOLE 3.0 PAD 5.0	
EY14	303.3	36	6042-000001	EYELET	EYELET 2.2 HOLE 3.0 PAD 5.0	
EY301	114.4	23.4	6042-000001	EYELET	EYELET 2.2 HOLE 3.0 PAD 5.0	
EY302	132.6	23.4	6042-000001	EYELET	EYELET 2.2 HOLE 3.0 PAD 5.0	
EY401	108	236	6042-000002	EYELET	EYELET 1.5 HOLE 2.2 PAD 4.0	
EY402	114.5	236	6042-000002	EYELET	EYELET 1.5 HOLE 2.2 PAD 4.0	
EY403	33.5	211	6042-000002	EYELET	EYELET 1.5 HOLE 2.2 PAD 4.0	
EY404	53.5	211	6042-000002	EYELET	EYELET 1.5 HOLE 2.2 PAD 4.0	
EY405	134.3	168.8	6042-000002	EYELET	EYELET 1.5 HOLE 2.2 PAD 4.0	
EY406	92.5	220.5	6042-000002	EYELET	EYELET 1.5 HOLE 2.2 PAD 4.0	
EY501	150	150.9	6042-000001	EYELET	EYELET 2.2 HOLE 3.0 PAD 5.0	
EY502	198	150.9	6042-000001	EYELET	EYELET 2.2 HOLE 3.0 PAD 5.0	
EY503	223.4	231.6	6042-000001	EYELET	EYELET 2.2 HOLE 3.0 PAD 5.0	
EY504	146.5	236.9	6042-000001	EYELET	EYELET 2.2 HOLE 3.0 PAD 5.0	
EY505	176.8	166.5	6042-000002	EYELET	EYELET 1.5 HOLE 2.2 PAD 4.0	
EY506	202.3	182.8	6042-000002	EYELET	EYELET 1.5 HOLE 2.2 PAD 4.0	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
EY507	176.7	195.5	6042-000002	EYELET	EYELET 1.5 HOLE 2.2 PAD 4.0	
EY508	188	166.5	6042-000002	EYELET	EYELET 1.5 HOLE 2.2 PAD 4.0	
EY509	135.5	202.7	6042-000002	EYELET	EYELET 1.5 HOLE 2.2 PAD 4.0	
EY510	110.5	117.3	6042-000002	EYELET	EYELET 1.5 HOLE 2.2 PAD 4.0	
EY511	197.5	204.5	6042-000002	EYELET	EYELET 1.5 HOLE 2.2 PAD 4.0	
EY512	175.5	204.5	6042-000002	EYELET	EYELET 1.5 HOLE 2.2 PAD 4.0	
EY601	217.5	31.5	6042-000002	EYELET	EYELET 1.5 HOLE 2.2 PAD 4.0	
EY602	192.5	56.5	6042-000002	EYELET	EYELET 1.5 HOLE 2.2 PAD 4.0	
EY603	192.5	36.5	6042-000002	EYELET	EYELET 1.5 HOLE 2.2 PAD 4.0	
EY604	217.5	46.5	6042-000002	EYELET	EYELET 1.5 HOLE 2.2 PAD 4.0	
EY605	225	67.6	6042-000001	EYELET	EYELET 2.2 HOLE 3.0 PAD 5.0	
EY606	132.6	70.6	6042-000001	EYELET	EYELET 2.2 HOLE 3.0 PAD 5.0	
EY607	143	127.5	6042-000002	EYELET	EYELET 1.5 HOLE 2.2 PAD 4.0	
EY608	243.2	67.6	6042-000001	EYELET	EYELET 2.2 HOLE 3.0 PAD 5.0	
EY609	114.4	70.6	6042-000001	EYELET	EYELET 2.2 HOLE 3.0 PAD 5.0	
EY610	225	20.4	6042-000001	EYELET	EYELET 2.2 HOLE 3.0 PAD 5.0	
EY611	278.5	27	6042-000002	EYELET	EYELET 1.5 HOLE 2.2 PAD 4.0	
EY612	243.2	20.4	6042-000001	EYELET	EYELET 2.2 HOLE 3.0 PAD 5.0	
EY613	292.3	55.8	6042-000002	EYELET	EYELET 1.5 HOLE 2.2 PAD 4.0	
EY614	245.8	91.8	6042-000001	EYELET	EYELET 2.2 HOLE 3.0 PAD 5.0	
EY615	245.8	81.8	6042-000001	EYELET	EYELET 2.2 HOLE 3.0 PAD 5.0	
FG601	295	10	3601-000004	FUSE-FERRULE	250V,3.15A,SLOW BLOW,CERAMIC,5	⚠
FH601	305.3	9.8	3602-000001	FUSE-CLIP,5.2X20,30MOHM	800GF,400-800GF	
HS102			BH62-30410A	HEAT/SINK	A6063S,T2.5	
HS301			BH62-30411A	HEAT/SINK	A6063S,T2.0	
HS501			BH62-30417A	HEAT/SINK-FBT	A1050S,T1.0,CKA42*7/5227	⚠
HS508			BH62-30015A	HEAT/SINK-TR	SCP-1,T1,SN	
HS602			BH62-30411A	HEAT/SINK	A6063S,T2.0	⚠
IC101	274.5	141	1201-001184	IC-VIDEO AMP	2141,DIP,20P,300MIL,SINGLE,P	⚡
IC102	281.5	241	1204-000010	IC-CHANNEL SELECTOR	LM2406,T0-220,11P,PLASTIC,85	⚡
IC201	38	32	1203-001274	IC-VOL. DETECTOR	7545,TO-92,3P,PLASTIC,4.35/4	
IC202	34	48.5	BH09-10303T	IC-MICOM MASKING	CKA,LSC442839B,SYNC-PROCESSOR	⚡
IC203	80	19.5	1103-001020	IC-EEPROM	24LC04,4Kx8BIT,DIP,8P,300MIL	
IC204	63.5	122	1103-001009	IC-EEPROM	24LC21,128X8BIT,DIP,8P,300MIL	⚡
IC301	112	50.8	1204-000013	IC-VERTICAL PROCESSO	TDA9302H,TO-220,9P,PLASTIC,3	⚡
IC302	92.5	25.5	1201-001034	IC-AMPLIFIER	L272M,DIP,8P,28V,1A,1W,STICK	
IC401	40	146.8	1204-001231	IC-DEF. PROCESSOR	TDA9109,DIP,32P,300MIL,PLASTIC	⚡
IC601	183	9.5	1203-000002	IC-LIN,431,REGULATOR	TO-92,3,36V(T)-SIMPLE	
IC602	246	38	BH13-10334H	IC	G-PROJECT, KA2H0880, SIP, 5P, FET	
IC603	73.8	8	1203-000001	IC-POSI.ADJUST REG.	7805,TO-220,3P,PLASTIC,4.8/5	
IC604	31	177.5	1203-000165	IC-LIN,KA78R12,REGULATOR	TO-220,4,5V	
IS601	303.3	29	3721-001006	PLUG-AC POWER	3P,10/24mm,SN	⚠
J14			BH39-40305U	JUMPER-WIRE	JUMPER-WIRE	14”
J15			BH39-40305U	JUMPER-WIRE	JUMPER-WIRE	15” SDD
JP209			BH39-40305U	JUMPER-WIRE	JUMPER-WIRE	14”
L101B	287	200.8	2701-001036	INDUCTOR-AXIAL	1.2uH,10%,9.8x4.2mm	
L101G	274.3	206.5	2701-001036	INDUCTOR-AXIAL	1.2uH,10%,9.8x4.2mm	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
L101R	303.8	227.5	2701-001036	INDUCTOR-AXIAL	1.2uH,10%,9.8x4.2mm	
L401	92.5	220.5	BH27-20003A	COIL-LINEARITY	0.06OHM,0.15,DR-1415,IVORY,35M	15" Philips
			BH27-20309T	COIL-LINEARITY	0.06OHM,16.5*16.5*30	14"
			BH27-20334K	COIL-LINEARITY	6.2UH	15" SDD
L402	143	138.5	BH27-20343L	COIL-CHOKE	170UH,10%,DR14*20,BULK	
L403	44.3	119.5	2701-000154	INDUCTOR-AXIAL	220uH,10%,4.2x9.8mm	
L501	110.5	117.3	BH27-20342V	COIL-CHOKE	200UH,15%,DR14*20,BULK	
L502	66.3	210	BH27-20342U	COIL-CHOKE	7.1MH,10%,DR8*11,BULK	
L503	194.3	119.5	2701-000154	INDUCTOR-AXIAL	220uH,10%,4.2x9.8mm	
L601	279.8	55.8	BH27-20022A	COIL-LINE FILTER	0.3OHM,-,B,1UEW0.40,5T,3	
L602	266	27	BH26-30008A	TRANS-LINE FILTER	15MH,8P,EE,SB-5S,15MH,EE-222	⚠
OP201	14.3	31.8	0601-001147	LED	ROUND,GRN,4.75mm,565nm	
OP601	199.5	17.5	0604-001018	PHOTO-COUPLER	DAR-TR,63-125%,200mW,DIP-4,ST	⚠
Q101	244.5	172.8	0501-000412	TR-SMALL SIGNAL	KSP42,NPN,625mW,TO-92,40	
Q102	251.5	180.3	0501-000277	TR-SMALL SIGNAL	KSA1013-Y,PNP,-900mW,TO-92L,TP	
Q201	16	12	0501-000586	TR-NPN,KSC945,TO-92,EBC	0.25W,60V,50V,5V,0.15A	
Q202	70.5	120	0501-000122	TR-NPN,2N3904,TO-92,EBC	0.625W,60V,40V,6V,0.2A	
Q203	35.5	88.5	0501-000303	TR-SMALL SIGNAL	KSA733-Y,PNP,250mW,TO-92,120	
Q301	100.5	84.8	0501-000586	TR-NPN,KSC945,TO-92,EBC	0.25W,60V,50V,5V,0.15A	
Q402	134.3	174.3	0502-001001	TR-POWER	KSC5088,NPN,1500V,1500V,8A,50W	
Q403	68.5	198	0501-000369	TR-NPN,KSC2331,TO-92L,ECB		
Q404	23	229.5	0505-000011	FET-N,IRF630,TO-220,GDS	75W,200V,9A	
Q405	15	228.8	0505-001102	FET-SILICON	IRFR/U230A,N,200V,7.5A,400mohm	
Q406	44.5	198.5	0501-000586	TR-NPN,KSC945,TO-92,EBC	0.25W,60V,50V,5V,0.15A	
Q407	55.5	200.3	0501-000586	TR-NPN,KSC945,TO-92,EBC	0.25W,60V,50V,5V,0.15A	
Q408	158.5	130	0501-000303	TR-SMALL SIGNAL	KSA733-Y,PNP,250mW,TO-92,120	
Q409	163	134.5	0501-000303	TR-SMALL SIGNAL	KSA733-Y,PNP,250mW,TO-92,120	
Q410	171.8	148.8	0503-000001	TR-DARLINGTON	KSE800, NPN,60V,60V,4A,40W,TO-126	
Q413	77	198	0501-000369	TR-NPN,KSC2331,TO-92L,ECB		
Q501	207.5	226.5	0501-000586	TR-NPN,KSC945,TO-92,EBC	0.25W,60V,50V,5V,0.15A	
Q502	214	227.5	0501-000586	TR-NPN,KSC945,TO-92,EBC	0.25W,60V,50V,5V,0.15A	
Q504	169.5	134.5	0501-000143	TR-SMALL SIGNAL	2N6520,PNP,625mW,TO-92,30-20	
Q506	219	222	0501-000303	TR-SMALL SIGNAL	KSA733-Y,PNP,250mW,TO-92,120	
Q507	101.5	180	0501-000586	TR-NPN,KSC945,TO-92,EBC	0.25W,60V,50V,5V,0.15A	
Q508	109.3	150	0505-000011	FET-N,IRF630,TO-220,GDS	75W,200V,9A	
Q509	101.5	174	0501-000303	TR-SMALL SIGNAL	KSA733-Y,PNP,250mW,TO-92,120	
Q510	201.5	132.5	0501-000492	TR-SMALL SIGNAL	MPS3646,NPN,625mW,TO-92,30-1	
Q601	277.5	115.5	0501-000586	TR-NPN,KSC945,TO-92,EBC	0.25W,60V,50V,5V,0.15A	
Q602	36	199	0501-000122	TR-NPN,2N3904,TO-92,EBC	0.625W,60V,40V,6V,0.2A	
Q603	143.5	67.5	0502-000249	TR-POWER	KSB772-Y,PNP,10W,TO-126,160-	
Q604	141.8	77.5	0501-000586	TR-NPN,KSC945,TO-92,EBC	0.25W,60V,50V,5V,0.15A	
R100	310.5	127.5	2001-000029	R-CARBON	100ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R101B	311.3	145.3	2001-000089	REF-CF,150K,5%,1/6W	150V,-1300 TO + 350PPM/C,R-	
R101G	311.3	150.8	2001-000090	R-CARBON	180Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R101R	311.3	156.3	2001-000089	REF-CF,150K,5%,1/6W	150V,-1300 TO + 350PPM/C,R-	
R102B	260.5	136.5	2001-000665	R-CARBON	33ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R102G	260.5	134	2001-000665	R-CARBON	33ohm,5%,1/6W,AA,TP,1.8x3.2mm	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
R102R	260.5	131.5	2001-000665	R-CARBON	33ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R103B	256.8	138.5	2001-000025	R-CARBON	75ohm,5%,1/4W,AA,TP,2.4x6.4mm	
R103G	254	138.5	2001-000025	R-CARBON	75ohm,5%,1/4W,AA,TP,2.4x6.4mm	
R103R	251.3	138.5	2001-000025	R-CARBON	75ohm,5%,1/4W,AA,TP,2.4x6.4mm	
R104B	279	230.5	2001-000021	R-CARBON	27ohm,5%,1/4W,AA,TP,2.4x6.4mm	
R104G	284	230.5	2001-000021	R-CARBON	27ohm,5%,1/4W,AA,TP,2.4x6.4mm	
R104R	289	230.5	2001-000021	R-CARBON	27ohm,5%,1/4W,AA,TP,2.4x6.4mm	
R105B	287	215	2001-000084	R-CARBON	100Kohm,5%,1/4W,AA,TP,2.4x6.4m	
R105G	312	213	2001-000084	R-CARBON	100Kohm,5%,1/4W,AA,TP,2.4x6.4m	
R105R	313.3	233.8	2001-000084	R-CARBON	100Kohm,5%,1/4W,AA,TP,2.4x6.4m	
R107B	305	201	2001-000028	R-CARBON(S)	100ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R107G	263.5	175.3	2001-000028	R-CARBON(S)	100ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R107R	310	183	2001-000028	R-CARBON(S)	100ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R108B	317.8	176.5	2001-000029	R-CARBON	100ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R108G	323	191.5	2001-000029	R-CARBON	100ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R108R	322.3	225.3	2001-000029	R-CARBON	100ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R109B	314.5	183	2001-000495	R-CARBON	20Kohm,5%,1/4W,AA,TP,2.4x6.4mm	
R109G	323	207.5	2001-000495	R-CARBON	20Kohm,5%,1/4W,AA,TP,2.4x6.4mm	
R109R	324.3	227.8	2001-000495	R-CARBON	20Kohm,5%,1/4W,AA,TP,2.4x6.4mm	
R110	271.5	219.5	2001-001070	R-CARBON(S)	120ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R111	270.3	150	2001-000029	R-CARBON	100ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R112	252.3	225.3	2001-000835	R-CARBON	51Kohm,5%,1/4W,AA,TP,2.4x6.4mm	
R113	264.5	153	2001-000029	R-CARBON	100ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R114	285	167.3	2001-000511	R-CARBON	220ohm,5%,1/2W,AA,TP,3.3x9mm	
R115	255.5	163.3	2001-000029	R-CARBON	100ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R116	267	153	2001-000029	R-CARBON	100ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R117	278	153	2001-000039	R-CARBON	390ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R118	272.5	153	2001-000039	R-CARBON	390ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R119	294	152	2001-000039	R-CARBON	390ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R120	254.8	194	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R121	252	176.8	2001-000090	R-CARBON	180Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R122	247	183.5	2001-000077	R-CARBON	47Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R201	69	33	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R202	66.5	33	2001-000077	R-CARBON	47Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R205	59	33	2001-000496	R-CARBON	20Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R206	56.5	33	2001-000496	R-CARBON	20Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R208	27.5	17	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R210	33	17	2001-000035	REF-CF,220,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R212	62.5	86	2001-000562	R-CARBON	27Kohm,5%,1/6W,AA,TP,1.8x3.2mm	15
R213	37.5	67.3	2001-000029	R-CARBON	100ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R214	32.5	67.3	2001-000029	R-CARBON	100ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R215	26.5	36	2001-000108	R-CARBON	18Kohm,5%,1/6W,AA,TP,1.8x3.2mm	15
			2001-000069	R-CARBON	12Kohm,5%,1/6W,AA,TP,1.8x3.2mm	14”
R216	80	77.5	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R217	29	36	2001-000101	R-CARBON	11Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R218	31.5	35.9	2001-000367	R-CARBON	15Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R219	42.5	68	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXI	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
R220	48	39.5	2001-000097	R-CARBON	1Mohm,5%,1/6W,AA,TP,1.8x3.2mm	
R221	51.5	33	2001-000868	R-CARBON	56ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R222	54	33	2001-000868	R-CARBON	56ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R223	65	68	2001-000868	R-CARBON	56ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R224	67.5	68	2001-000868	R-CARBON	56ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R225	25	27	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R226	51.3	96.8	2001-000040	R-CARBON	470ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R227	44.3	101.5	2001-000077	R-CARBON	47Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R228	46.8	101.5	2001-000077	R-CARBON	47Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R229	32.5	11	2001-000042	R-CARBON	1Kohm,5%,1/4W,AA,TP,2.4x6.4mm	
R230	60	109.5	2001-000868	R-CARBON	56ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R231	54.3	17	2001-000053	R-CARBON	3.3Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R232	56.8	17	2001-000053	R-CARBON	3.3Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R233	65.8	27	2001-000029	R-CARBON	100ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R234	54	109.5	2001-000868	R-CARBON	56ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R235	61.8	17	2001-000868	R-CARBON	56ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R236	56.5	109.5	2001-000868	R-CARBON	56ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R237	48.3	25	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R238	59.3	17	2001-000868	R-CARBON	56ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R239	77.5	81	2001-001099	REF-CF,2.7K,5%,1/2W(S	300V,-200 TO +200PPM/C,R-AX	
R240	62.5	109.5	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R241	25	119.5	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R242	25	109.8	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R243	25	107.3	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R244	25	94.8	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R245	37	117	2001-000106	R-CARBON	1.5Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R246	37	114.5	2001-000106	R-CARBON	1.5Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R247	37	104.8	2001-000106	R-CARBON	1.5Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R248	37	102.3	2001-000106	R-CARBON	1.5Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R249	22.5	116	2001-000889	REF-CF,6.8K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R250	22.5	109.3	2001-000889	REF-CF,6.8K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R251	22.5	104.5	2001-000889	REF-CF,6.8K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R252	13	67	2001-000889	REF-CF,6.8K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R253	15	119	2001-000367	R-CARBON	15Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R254	13.5	136.5	2001-000367	R-CARBON	15Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R256	222.5	107	2001-000868	R-CARBON	56ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R257	222.5	104.5	2001-000553	R-CARBON	270ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R258	222.5	102	2001-000553	R-CARBON	270ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R259	224	98.5	2001-000868	R-CARBON	56ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R260	247.3	109.5	2001-000868	R-CARBON	56ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R262	40	67.3	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R264	21.5	20.5	2001-000652	R-CARBON	330ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R266	40.8	115.5	2001-000053	R-CARBON	3.3Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R267	30.5	27	2001-000072	R-CARBON	22Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R268	17.3	53	2001-000367	R-CARBON	15Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R269	18	74	2001-000889	REF-CF,6.8K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R270	45	68	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
R271	227.5	109.5	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R301	132	109.7	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R302	94	89.5	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R305	93.5	68	2001-000059	REF-CF,5.6K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R306	93.5	70.5	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R307	133.5	17.5	2008-000003	R-FUSIBLE	0.22ohm, 5%, 1/2W, AT, TP, 3.5x9.4mm	
R308	149.5	11.8	2008-000003	R-FUSIBLE	0.22ohm, 5%, 1/2W, AT, TP, 3.5x9.4mm	
R309	125.5	35.5	2001-000245	REF-CF,1.5,5%,1/2W	350V,-350 TO +350PPM/C,R-AX	
R310	136.5	75.3	2003-000650	R-METAL OXIDE(S)	330ohm,5%,2W,AA,TP,4x12mm	
R311	121.5	55	2004-001022	REF-MF,5.6K,1%,1/4W	250V,-100 TO +100PPM/C,R-AX	
R312	121.5	80	2003-000412	R-METAL OXIDE(S)	0.9ohm,5%,2W,AA,TP,4x12mm	
R313	101.5	59.5	2001-000069	R-CARBON	12Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R314	101.5	45	2001-000104	R-CARBON	1.2Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R315	101.5	50.8	2001-000064	R-CARBON	7.5Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R316	88	21	2001-000075	R-CARBON	39Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R317	85.5	39.5	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R318	104.5	28.5	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXI	
R319	88	30.5	2001-000064	R-CARBON	7.5Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R320	100.5	17	2003-000807	R-METAL OXIDE(S)	82ohm,5%,2W,AA,TP,4x12mm	
R321	85.5	28	2001-000083	R-CARBON	82Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R322	111.3	84.3	2001-000066	R-CARBON(S)	10Kohm,5%,1/2W,AA,TP,2.4x6.4mm	
R401	185.5	132.8	2001-000072	R-CARBON	22Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R403	28.5	144.5	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXI	
R404	28.5	147	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXI	
R405	72	143	2001-000097	R-CARBON	1Mohm,5%,1/6W,AA,TP,1.8x3.2mm	⚠
R406	47.8	128	2004-001136	R-METAL	6.8Kohm,1%,1/4W,AA,TP,2.4x6.4m	
R407	81	137.5	2001-000106	R-CARBON	1.5Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R408	55.8	134.3	2001-000048	REF-CF,2.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R409	44.5	163	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXI	
R410	78.5	178.8	2003-000587	R-METAL OXIDE(S)	22ohm,5%,1W,AA,TP,3.3x9mm	
R412	69.5	221.3	2001-000020	REF-CF,22,5%,1/2W(S	300V,-200 TO +200PPM/C,R-AX	
R414	111.3	220.5	2001-000016	R-CARBON(S)	1ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R415	135.5	218	2001-000525	R-CARBON	22ohm,5%,1/4W,AA,TP,2.4x6.4mm	
R416	75.5	215	2003-000009	R-METAL OXIDE(S)	220ohm,5%,1W,AA,TP,3.3x9mm	
R417	68	178.8	2001-001107	REF-CF,220,5%,1/2W(S	300V,-200 TO +200PPM/C,R-AX	
R418	58.5	183.5	2001-000404	R-CARBON	180ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R419	63.5	198.5	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXI	
R420	29.8	192	2001-000048	REF-CF,2.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R421	27	192	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R422	19.5	217.1	2001-000097	R-CARBON	1Mohm,5%,1/6W,AA,TP,1.8x3.2mm	
R423	9.5	217	2001-000097	R-CARBON	1Mohm,5%,1/6W,AA,TP,1.8x3.2mm	
R424	51	179.3	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R425	53.5	179.3	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R427	23	216.9	2001-000076	REF-CF,47K,5%,1/4W	250V,-600 TO -150PPM/C,R-AX	
R428	12.5	217	2001-000076	REF-CF,47K,5%,1/4W	250V,-600 TO -150PPM/C,R-AX	
R430	163	114	2001-000721	R-CARBON	4.3Kohm,5%,1/4W,AA,TP,2.4x6.4m	
R431	168	151.5	2001-000089	REF-CF,150K,5%,1/6W	150V,-1300 TO + 350PPM/C,R-	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
R432	80.5	119.3	2001-000090	R-CARBON	180Kohm,5%,1/6W,AA,TP,1.8x3.2m	15”
			2001-000086	R-CARBON	100Kohm,5%,1/6W,AA,TP,1.8x3.2m	14”
R434	166.5	102.8	2001-000538	R-CARBON	24Kohm,5%,1/6W,AA,TP,1.8x3.2mm	15”
			2001-000562	R-CARBON	27Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R435	163	143.5	2001-000053	R-CARBON	3.3Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R436	165.5	143.5	2001-000836	R-CARBON	51Kohm,5%,1/6W,AA,TP,1.8x3.2mm	15”
R437	55.5	161	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R438	74	115	2001-000088	R-CARBON	120Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R439	18.8	88	2001-000868	R-CARBON	56ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R440	18.8	90.5	2001-000868	R-CARBON	56ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R441	47.5	115	2001-000367	R-CARBON	15Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R442	78	143	2001-000531	R-CARBON	240Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R443	75	154.8	2001-000547	R-CARBON	270Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R444	216.5	189.5	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R445	98.3	126.5	2001-000106	R-CARBON	1.5Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R447	75.1	193.8	2003-000276	R-METAL OXIDE	33ohm,5%,1W,AA,TP,4.3x12mm	
R448	131.5	197	2001-000246	R-CARBON	1.5ohm,5%,1/4W,AA,TP,2.4x6.4mm	
R502	92.5	165.5	2001-000069	R-CARBON	12Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R503	81.5	160	2001-000079	R-CARBON	56Kohm,5%,1/6W,AA,TP,1.8x3.2mm	⚠
R504	198.5	231.5	2001-000562	R-CARBON	27Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R505	210.5	226.5	2001-000104	R-CARBON	1.2Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R506	95	153.3	2004-000216	R-METAL	10Kohm,1%,1/4W,AA,TP,2.4x6.4mm	⚠
R507	81	140	2001-000075	R-CARBON	39Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R508	95	162.5	2004-000284	R-METAL	12Kohm,1%,1/4W,AA,TP,2.4x6.4mm	⚠
R509	82.5	177.5	2004-004095	R-METAL	2.36Kohm,1%,1/4W,AA,TP,2.4x6.4	⚠
R510	184.5	230	2001-000836	R-CARBON	51Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R511	219	209	2001-000057	REF-CF,5.1K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R512	180.3	144	2001-000547	R-CARBON	270Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R513	227.3	167.3	2008-000106	REF-FUSIBLE,0.56,5%,1/2W	-350 TO +350PPM/C,R-AXIAL	
R515	158	114	2001-000889	REF-CF,6.8K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R516	224	189.5	2001-000688	R-CARBON	390Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R518	212.5	211.5	2001-000090	R-CARBON	180Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R520	180.3	141.5	2001-000115	R-CARBON	82Kohm,5%,1/4W,AA,TP,2.4x6.4mm	
			2001-000078	R-CARBON	56Kohm,5%,1/4W,AA,TP,2.4x6.4mm	14” ORION
R521	207.5	156.5	2001-000107	R-CARBON(S)	150Kohm,5%,1/2W,AA,TP,2.4x6.4m	
R522	206.5	159	2001-000096	R-CARBON(S)	1Mohm,5%,1/2W,AA,TP,2.4x6.4mm	
R523	216	218	2001-000688	R-CARBON	390Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R524	213.3	215.5	2001-000106	R-CARBON	1.5Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R525	212.8	135.3	2001-000100	R-CARBON	2.2Mohm,5%,1/6W,AA,TP,1.8x3.2m	
R527	105	182.3	2001-001099	REF-CF,2.7K,5%,1/2W(S	300V,-200 TO +200PPM/C,R-AX	
R528	124	167.8	2003-000007	REF-MO,82,5%,3W(S	350V,-350 TO +350PPM/C,R-AX	
R529	108	182.3	2001-000110	REF-CF,10,5%,1/4W	250V,-350 TO +350PPM/C,R-AX	
R530	102.5	129	2005-000401	R-WIRE WOUND	0.47ohm,5%,2W,AA,TP,4x12mm	
R531	122.5	147.5	2003-000386	REF-MO,910,5%,2W	350V,-200 TO +200PPM/C,R-AX	
R532	221.5	189.5	2001-000091	R-CARBON	220Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R534	74	157.3	2001-000097	R-CARBON	1Mohm,5%,1/6W,AA,TP,1.8x3.2mm	
R536	190	130	2001-000048	REF-CF,2.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
R537	190	127.5	2001-000053	R-CARBON	3.3Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R538	196	137.5	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R539	201.3	122.5	2001-000069	R-CARBON	12Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R540	190	132.5	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R542	219.8	143.5	2001-000064	R-CARBON	7.5Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R543	178.5	138.5	2001-000074	R-CARBON	33Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R544	169.5	115.8	2001-003105	R-CARBON	1ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R545	170	122.8	2001-003105	R-CARBON	1ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R546	181	226.5	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R602	286	114.5	2001-000027	R-CARBON	100ohm,5%,1/4W,AA,TP,2.4x6.4mm	
R603	267.3	114.5	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R604	184.5	18.8	2001-000111	R-CARBON	150ohm,5%,1/4W,AA,TP,2.4x6.4mm	
R605	172	9	2004-001060	R-METAL	51Kohm,1%,1/4W,AA,TP,2.4x6.4mm	⚠
R606	195.5	12.5	2001-000106	R-CARBON	1.5Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R607	175	9	2001-000889	REF-CF,6.8K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	⚠
R609	178	9	2004-004095	R-METAL	2.36Kohm,1%,1/4W,AA,TP,2.4x6.4	⚠
R611	174.5	87	2003-000006	R-METAL OXIDE	47ohm,5%,1W,AA,TP,4.3x12mm	
R612	250.5	10	2003-000741	REF-MO,56K,5%,3W(S	500V,-200 TO +200PPM/C,RE-R	
R613	164	56	2001-000432	R-CARBON	1Mohm,5%,1/4W,AA,TP,2.4x6.4mm	
R614	284.8	14	2001-000642	REF-CF,330K,5%,1/2W	350V,-600 TO -150PPM/C,R-AX	
R615	247.5	53.5	2001-000374	R-CARBON	15ohm,5%,1/4W,AA,TP,2.4x6.4mm	
R616	266	68.3	2003-000771	REF-MO,68K,5%,2W(S	500V,-200 TO +200PPM/C,R-AX	
R617	34.5	175	2001-000987	REF-CF,820K,5%,1/4W	250V,-1000 TO -500PPM/C,R-A	
R618	258.5	40.5	2003-000010	REF-MO,8.2K,5%,3W(S	350V,-350 TO +350PPM/C,R-AX	
R619	39	187	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R620	204	92	2003-000432	R-METAL OXIDE(S)	1.5Kohm,5%,3W,AA,TP,6x16mm	
R621	150	78	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-A	
R622	163	52.8	2003-000631	R-METAL OXIDE(S)	3.3ohm,5%,3W,AA,TP,6x16mm	15”
			2003-000005	R-METAL OXIDE(S)	1ohm,5%,2W,AA,TP,4x12mm	14”
R623	222	76.5	2001-001163	R-CARBON(S)	560ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R624	144	71.5	2001-000077	R-CARBON	47Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R625	151	74	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXI	
R626	195.5	15	2001-000106	R-CARBON	1.5Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R628	181.5	39.5	2001-000019	R-CARBON(S)	10ohm,5%,1/2W,AA,TP,2.4x6.4mm	
RL601	286.3	85	3501-000266	RELAY-POWER	12V,720m/W,5A,2FormA,3mS	
RL602	290	106	3501-000136	RELAY-MINIATURE	12V,360mW,5A,1FormA,10mS,10mS	
SK101	305.3	159	4715-000001	SURGE ABSORBER	1KV,+50-10%	
SK102	281.5	171.3	4715-000106	SURGE ABSORBER	300V,CHIP	
SK103	295	178.5	3704-001015	SOCKET-CRT	8P,15.24PI,25.6PI,SN	
SW201	7	189.5	3404-000244	SWITCH-TACT,7.3X7.1X4	12V,50MA,SPST,160G,MECH	
SW202	7	175.5	3404-000244	SWITCH-TACT,7.3X7.1X4	12V,50MA,SPST,160G,MECH	
SW203	7	161.5	3404-000244	SWITCH-TACT,7.3X7.1X4	12V,50MA,SPST,160G,MECH	
SW204	7	20	3404-000244	SWITCH-TACT,7.3X7.1X4	12V,50MA,SPST,160G,MECH	
SW205	7	104.4	3404-000244	SWITCH-TACT,7.3X7.1X4	12V,50MA,SPST,160G,MECH	
SW206	7	90.4	3404-000244	SWITCH-TACT,7.3X7.1X4	12V,50MA,SPST,160G,MECH	
SW207	7	76.4	3404-000244	SWITCH-TACT,7.3X7.1X4	12V,50MA,SPST,160G,MECH	
SW208	7	62.4	3404-000244	SWITCH-TACT,7.3X7.1X4	12V,50MA,SPST,160G,MECH	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
SW209	7	120.2	3404-000244	SWITCH-TACT,7.3X7.1X4	12V,50MA,SPST,160G,MECH	
SW210	7	131.7	3404-000244	SWITCH-TACT,7.3X7.1X4	12V,50MA,SPST,160G,MECH	
SW211	7	147.5	3404-000244	SWITCH-TACT,7.3X7.1X4	12V,50MA,SPST,160G,MECH	
SW401	86.5	237	3406-000002	SWITCH-TOGGLE,SP3T	ON-ON-ON,STRAIGHT	
T401	95	187.5	BH26-30336A	TRANS-HOR.DRIVE	9.6MH,6P,EE2017,SB-5S,9.6MH/10	⚠
T501	188	181	BH26-10335A	TRANS-FBT	1.22mH,12P,FKD-15A001	
T601	217.5	26.5	BH26-20335T	TRANS-POWER	430uH,16P,EER3541,PL-3/PM-2,7.	⚠
T602	214.5	79	BH26-30302S	TRANS-SYNC,250UH	C/MONITOR,CVL 4951	⚠
TCO	172	242	BH39-40305U	JUMPER-WIRE	JUMPER-WIRE	
TH601	263.5	95.5	1404-000002	THERMISTOR-NTC	NTC,9OHM,20%	
TH602	272.5	77	1404-001020	THERMISTOR-NTC	8ohm,15%,17mW/C,BK	
TILT	175.3	242	BH39-40305U	JUMPER-WIRE	JUMPER-WIRE	
VR101B	322.8	141	2103-000007	vr3	1/10W	
VR101G	322.8	149.5	2103-000007	vr3	1/10W	
VR101R	322.8	158	2103-000007	vr3	1/10W	
VR102B	322.8	182.5	2103-000291	vr3	1/10W	
VR102G	322.8	201.5	2103-000291	vr3	1/10W	
VR102R	322.8	221.5	2103-000291	vr3	1/10W	
VR401	228.3	236.8	2103-000005	vr3	1/10W	
VR501	193	237	2103-000005	vr3	1/10W	
X201	47.5	43.5	2801-003033	CRYSTAL-UNIT	4MHz,30ppm,28-AAM,20pF,100ohm	

10-1-4 USB OPTION

Loc. No.	Code No.	Description	Specification	Remarks
C622	2401-000038	C-AL	470UF,20%,25V,GP,TP,10X12.5	
CN604	3722-001100	JACK-DIN	4P/2C,6MM,AG,BLK	
D612	0402-000005	DIODE-RECTIFIER	31DF4,400V,3A,DO-201AD	

10-1-5 TCO OPTION

Loc. No.	Code No.	Description	Specification	Remarks
CN606	3711-000178	CONNECTOR-HEADER	1WALL,2P,1R,3.96mm,STRAIGHT,SN	
JP203	BH39-40305U	JUMPER-WIRE	JUMPER-WIRE	
RL601	3501-000266	RELAY-POWER	12V,720mV,5A,2formA,8mS,3mS	

10-1-6 TILT OPTION

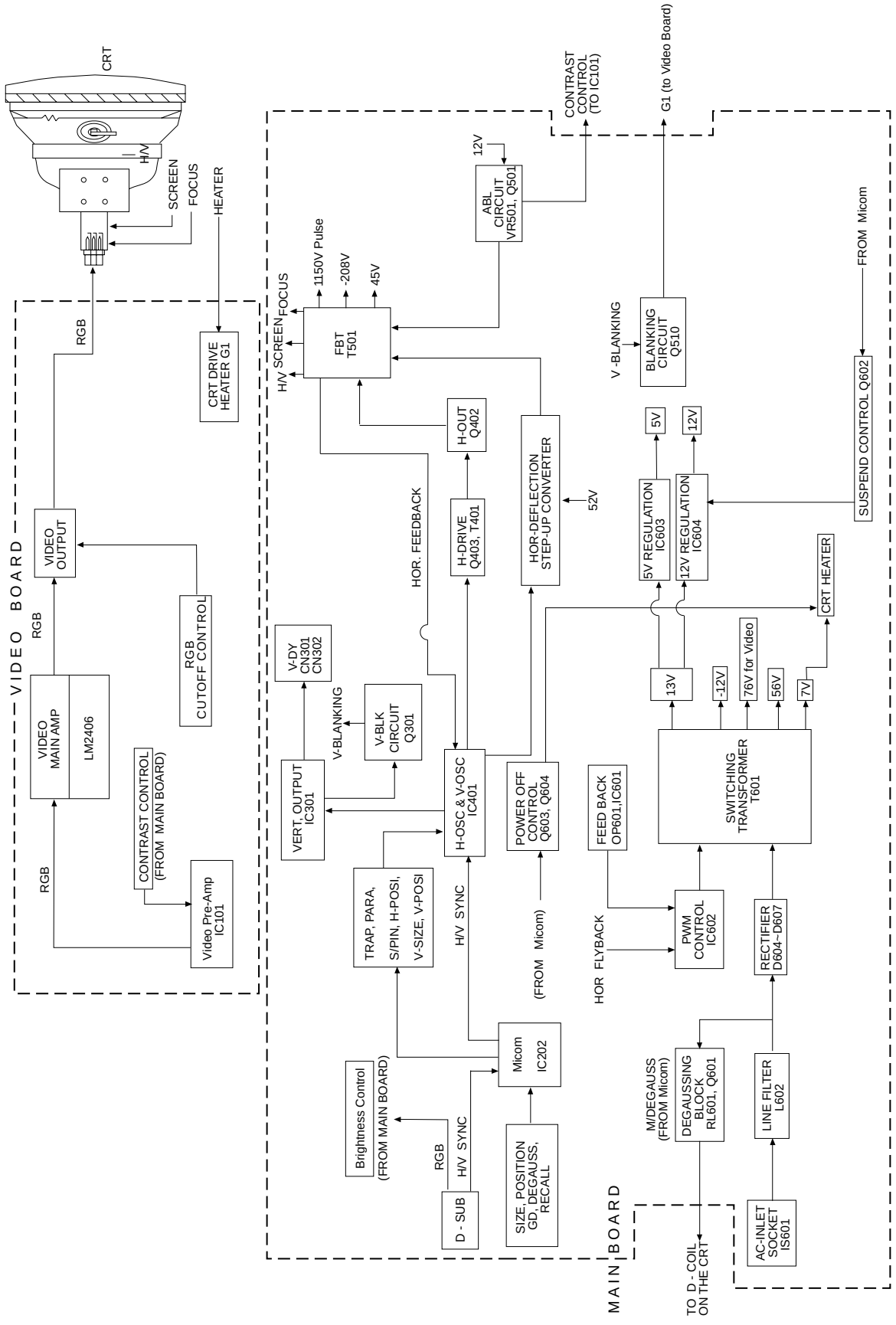
Loc. No.	Code No.	Description	Specification	Remarks
C212	2401-000023	C-AL,ELEC,50V,1UF	1UF,20%,50V,GP,TP,5X11,5MM	
C312	2305-000001	C-FRLM,MPEF	470NF,10%,63V,TP,6.0X15.5X7.5MM	
CN303	3711-000024	CONNECTOR-HEADER	BOX,3P,1R,2.5MM,STRAIGHT	
IC302	1201-001034	IC-AMPLIFIER	272,DIP,8P,150MIL,DUAL,PLAST	
JP207	BH39-40305U	JUMPER-WIRE	JUMPER-WIRE	
R216	2001-000067	R-CF,10K,5%,1/6W	10KOHM,5%,1/6W,AA,TP,1.8X3.2MM	
R316	2001-000075	R-CF,39K,5%,1/6W	39KOHM,5%,1/6W,AA,TP,1.8X3.2MM	
R317	2001-000067	R-CF,10K,5%,1/6W	10KOHM,5%,1/6W,AA,TP,1.8X3.2MM	
R318	2001-000043	R-CF,1K,5%,1/6W	1KOHM,5%,1/6W,AA,TP,1.8X3.2MM	
R319	2001-000064	R-CF,7.5K,5%,1/6W	7.5KOHM,5%,1/6W,AA,TP,1.8X3.2MM	
R320	2003-000807	R-MO,82,5%,2W	5.6KOHM,2%,1/8W,AD,TP,1.8X3.2MM	
R321	2001-000083	R-CF,82K,5%,1/6W	82KOHM,5%,1/6W,AA,TP,1.8X3.2MM	

Others

Loc. No.	Code No.	Description	Specification	Remarks
CRT	BH03-10337E	CRT-COLOR,MPR II,14"	M34KZM16XX61(A)	ORION
	BH03-10338J	CRT-COLOR,MPR II,14"	M34QBH351X122	SDD (N.H.)
	BH03-10338P	CRT-COLOR,MPR II,14"	M34QBH351X122(M)	SDD (E.)
	BH03-10338Q	CRT-COLOR,MPR II,14"	M34QBH351X122(R)	SDD (S.H.)
	BH03-10337F	CRT-COLOR,MPR II,14"	M34AFA83X46	CPT
	BH03-10337Z	CRT-COLOR,MPR II,15"	M36QAW351X105(E/LP)	SDD (N.H.)
	BH03-10338W	CRT-COLOR,MPR II,15"	M36QAW351X105(M/E/LP)	SDD (E.)
	BH03-10337X	CRT-COLOR,MPR II,15"	M36QAW351X105(R/E/LP)	SDD (S.H.)
	BH03-10335X	CRT-COLOR,MPR II,15"	M36EDR320X151	Philips
	BH03-10335X	CRT-COLOR,TCO,15"	M36EDR320X151	Philips
	BH03-10338K	CRT-COLOR,TCO,15"	M36QAW351X105(T4/LP)	SDD
CRT GND	BH39-40362A	CBF-CRT GROUND	2P,410MM,BLK,UL1015,AWG18,171	14"
	BH39-40361Z	CBF-CRT GROUND	2P,800MM,GRAY,UL1571,AWG28,S	15"
D-COIL	BH27-10335T	DEGAUSSING COIL	290*200*980,10.2MH	14"
	BH27-10335S	DEGAUSSING COIL	255*255*980,11.0MH	15"
	BH27-10375R	DEGAUSSING COIL	255*255*980,11.0MH	15" TILT
MAGNET RUBBER	3302-000006	MAG-RUBBER MAGNET	AF,14G,1620-1980G,0.58-0.9 MGOE	
P/CORD	BH39-10007A	CBF-POWER/CORD	DET,H05VV-F,250V/6A,1830MM	
	BH39-10339E	CBF-POWER/CORD	DET,SVT,125V,7A/10A,IVORY,1830MM	
SIGNAL CABLE	BH39-20336S	CBF-SIGNAL	ATT,1200MM,15P,IVORY,UL2969	14"
	BH39-20336T	CBF-SIGNAL	ATT, 1500MM,15P,IVORY,UL2969	15"

* N.H. : Northern Hemisphere
S.H. : Southern Hemisphere
E. : Equator

8 Block Diagram



10-2 Semiconductor Lead Identification

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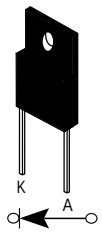
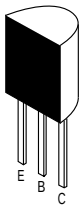
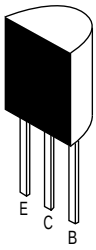
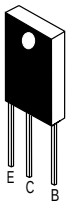
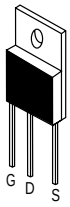
	FMP-G2FS	D403
	KSC945	Q201, Q301, Q406, Q407, Q501, Q502, Q507, Q601, Q604
	KSA733	Q203, Q408, Q409, Q505, Q506, Q509
	2N3904	Q202, Q602
	KSP42	Q101
	2N6520	Q504
	MPS3646	Q510
	KSC2331	Q403, Q413
	KSA1013	Q102
	KSB772	Q603
	KSE800	Q410
	IRF630	Q404, Q508
	IRFR/U230A	Q405

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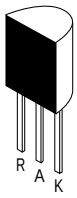
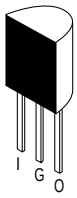
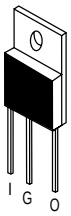
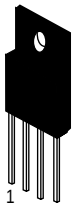
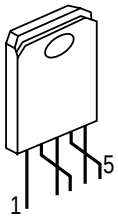
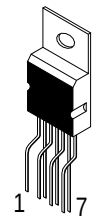
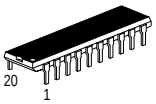
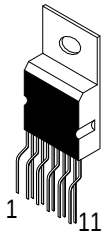
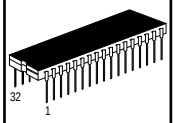
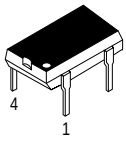
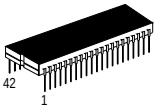
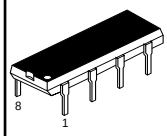
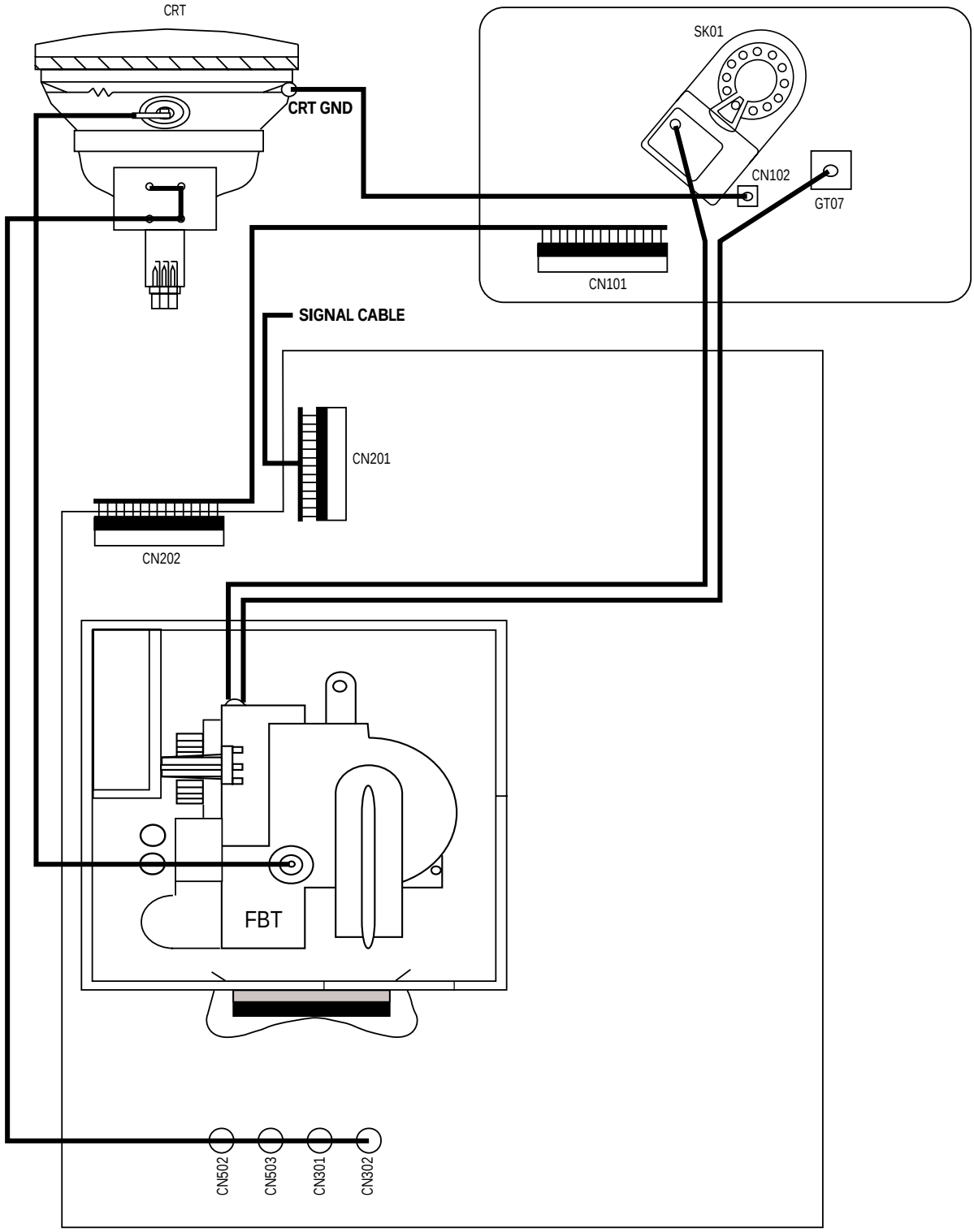
	KSC5088	Q402
	KA431	IC601
	KA7545	IC201
	MC7805	IC603
 1 : Vin, 2 : Vout, 3 : GND, 4 : Vcc	KA78R12	IC604
 1 : Drain, 2 : GND, 3 : Vcc, 4 : F/B, 5 : Sync	KA2H0880	IC602

PARTS	TYPE NO.	REF. NO.	PARTS	TYPE NO.	REF. NO.
	TDA9302H	IC301		KA2141	IC101
	LM2406	IC102		TDA9109	IC401
	LTV817M-SM	QP601		MC68HC705	IC202
	24LC04 24LC21 L272M	IC203 IC204 IC302			

9 Wiring Diagram



11 Schematic Diagrams

11-1 Cautions

1. The areas marked with a ⚠, ⚡ or ☢ on the schematic diagram designate components which have special characteristics important for safety.
   Replace these parts only with parts identical to those in the original circuit and those specified in the parts list.
   Before replacing any of these components, carefully read the "Product Safety Notice."
2. Areas marked with a ☢ on the schematic diagram designate controls which have been sealed for safety during manufacturing.
   If these controls need adjustment, they must be replaced with new controls and then sealed after their adjustment.
3. When taking measurements, pay special attention to the following:

   1) Do not use your instrument between primary ground (symbol ⏚) and secondary circuit.

   2) Do not use your instrument between secondary ground (symbol ⏚) and primary circuit.

11-2 Notes

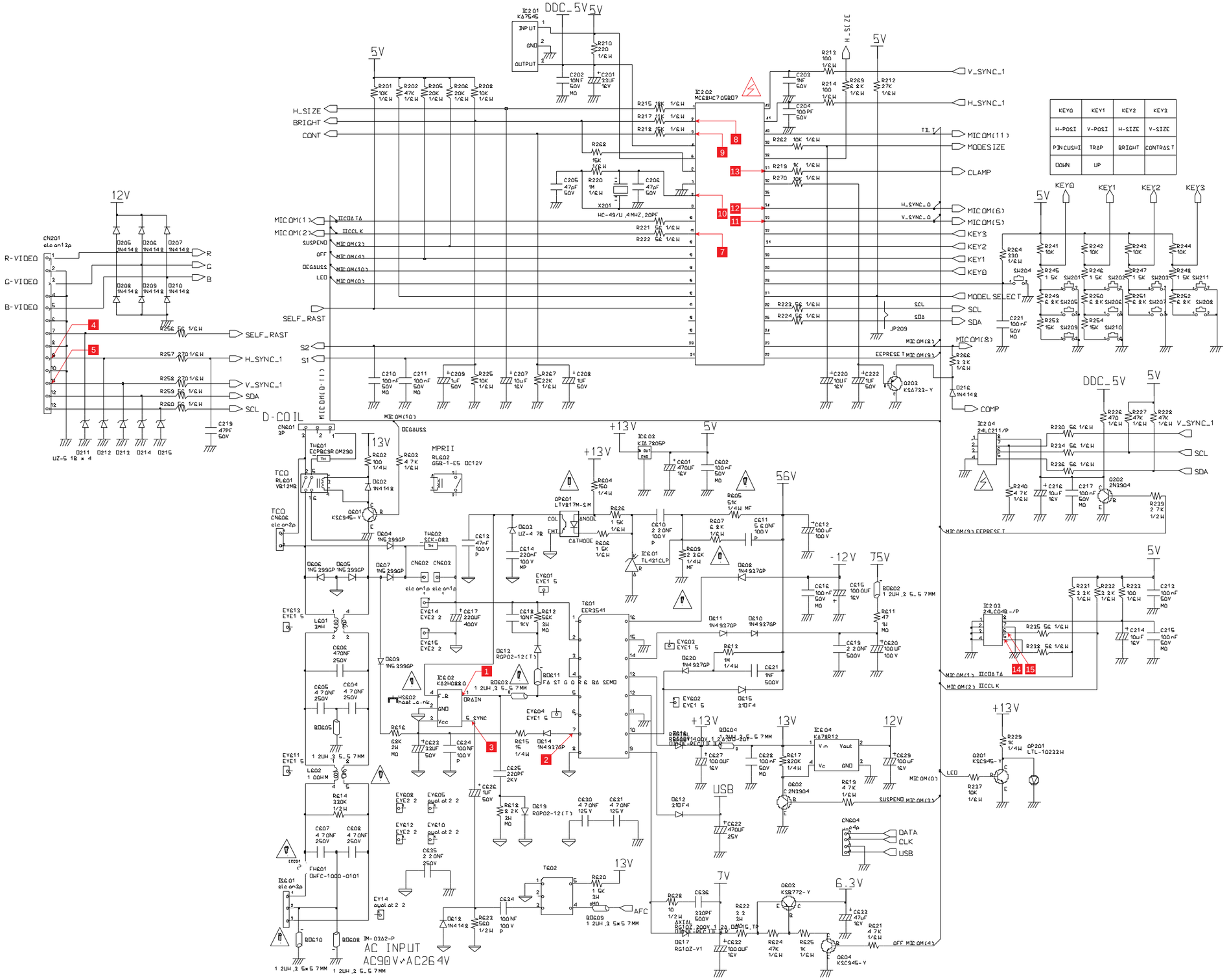
1. Resistance is shown in OHM. K = 1,000, M = 1,000,000 and the rated power of resistors not noted in the schematic diagram is 1/4W.
2. Capacitance is shown in μF. Capacitances not otherwise noted are shown in pF (1μF = 1,000,000 pF). Rated voltage of condensers not otherwise noted in the schematic diagram is 50 V.

11-3 Abbreviations and Symbols

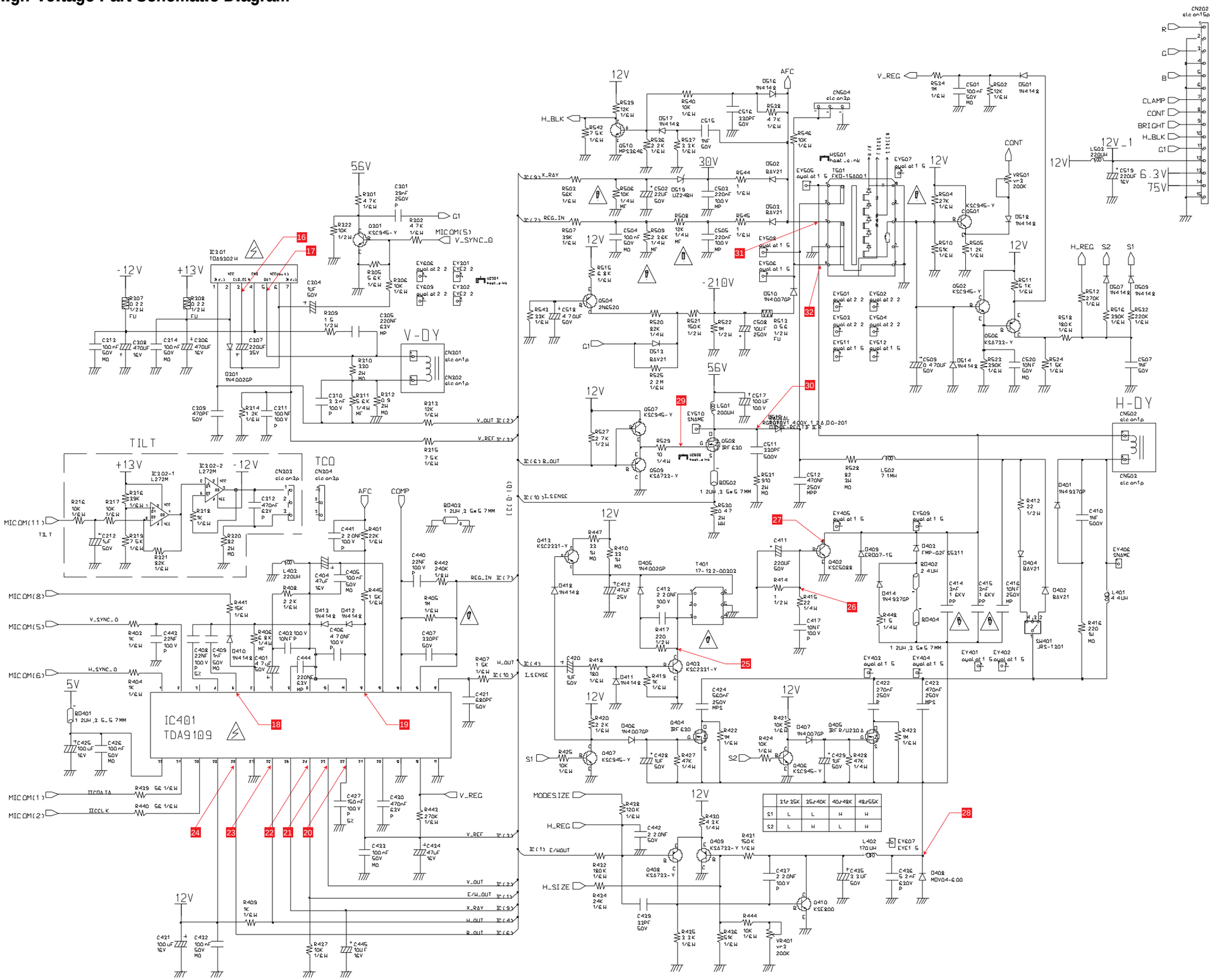
MO	R-Metal Oxide	WW	R-Wire Wound
FU	Fusible	C	R-Composition
CM	R-Cement	MPP	Metal Polypropylene
MP	C-Metalized Polyester	T	C-Tantalum
P	C-Polyester	☢	Can emit X-radiation
⏚	Hot Ground	⏚	Cold Ground
⚡	Electrostatically Sensitive Device (ESD)	⚠	Provides special safety considerations

1. The secondary voltage is read with an SSVM from the indicated point to a cold ground (⏚).
   The primary voltage is read with an SSVM from the indicated point to a hot ground (⏚).
2. This schematic diagram is subject to change without notice.

11-4 Micom/SMPS Part Schematic Diagram

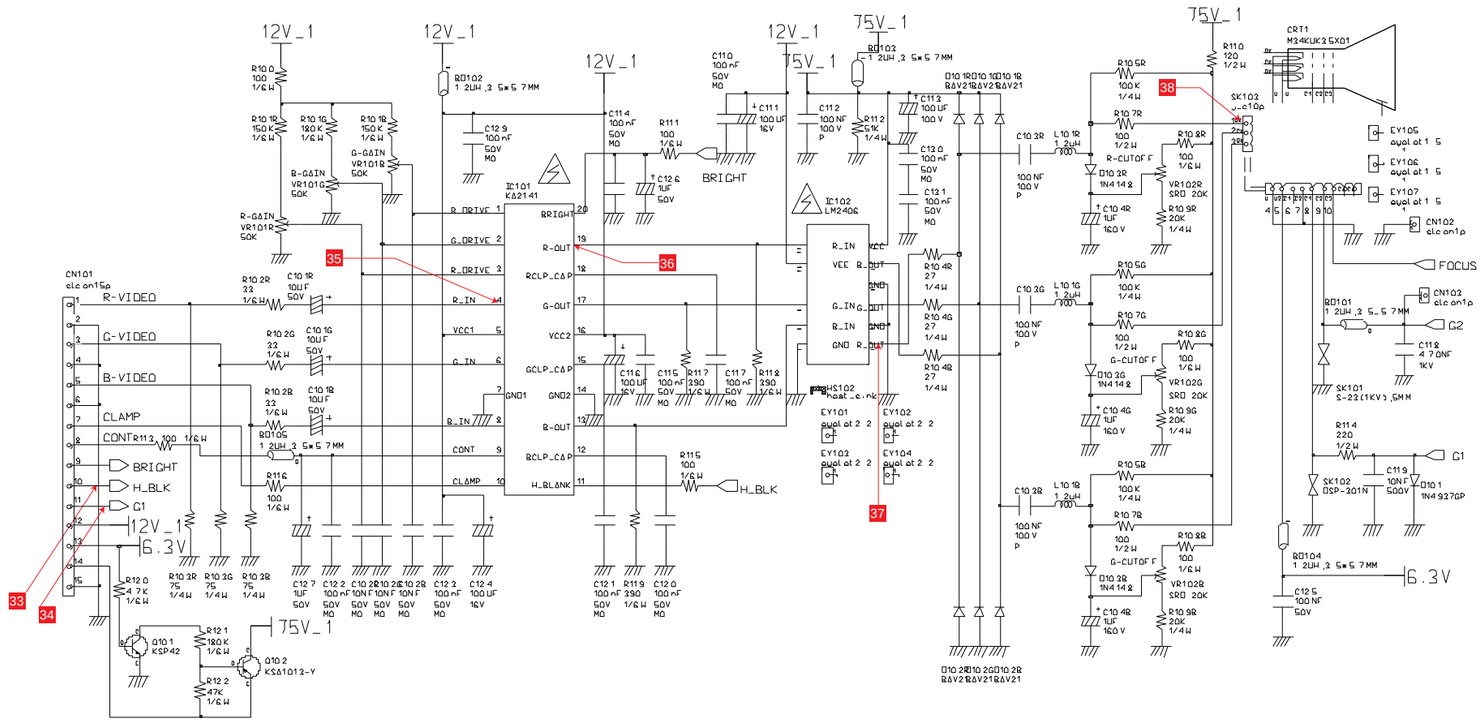


11-5 HV-Defl/High-Voltage Part Schematic Diagram

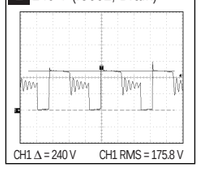


	21~25K	25~40K	40~48K	48~55K
S1	L	L	H	H
S2	L	H	L	H

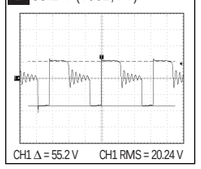
11-6 Video Part Schematic Diagram



1 240 V (IC602, Drain)



2 55.2 V (T601, #7)



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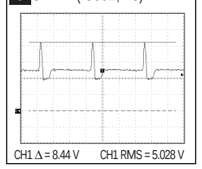
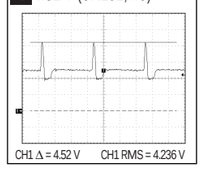
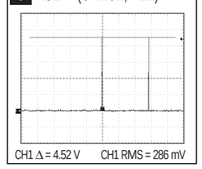


4 4.52 V (CN201, #9)



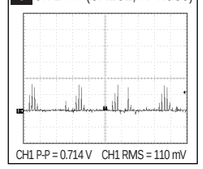
H-Sync

5 4.52 V (CN201, #11)

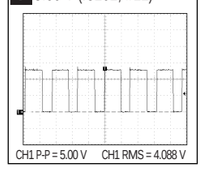


V-Sync

6 0.714 V (CN201, R-Video)

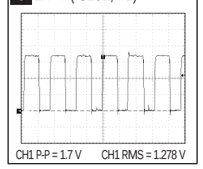


7 5.00 V (IC202, #11)

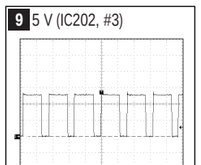


H-Size, duty

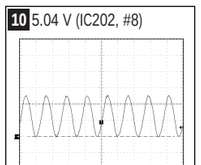
8 1.7 V (IC202, #2)



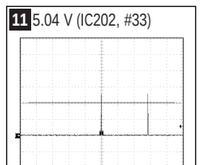
9 5 V (IC202, #3)



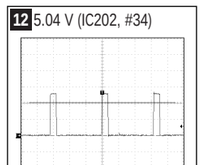
10 5.04 V (IC202, #8)



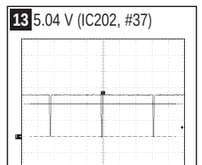
11 5.04 V (IC202, #33)



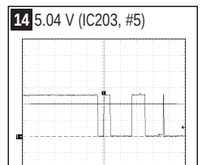
12 5.04 V (IC202, #34)



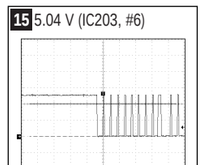
13 5.04 V (IC202, #37)



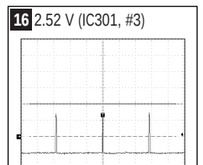
14 5.04 V (IC203, #5)



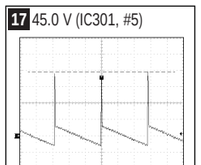
15 5.04 V (IC203, #6)



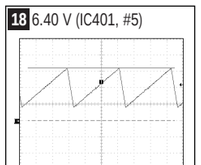
16 2.52 V (IC301, #3)



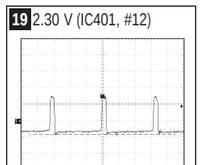
17 45.0 V (IC301, #5)



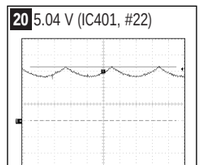
18 6.40 V (IC401, #5)



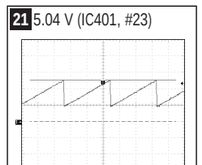
19 2.30 V (IC401, #12)



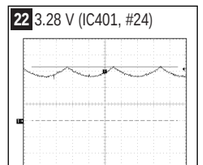
20 5.04 V (IC401, #22)



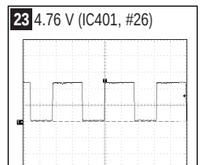
21 5.04 V (IC401, #23)



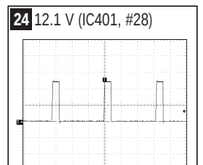
22 3.28 V (IC401, #24)



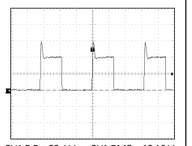
23 4.76 V (IC401, #26)



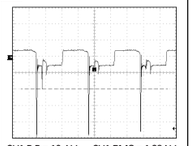
24 12.1 V (IC401, #28)



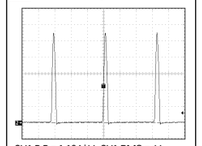
25 29.4 V (Q403, Collector)



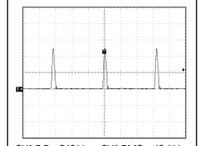
26 10.4 V (Q402, Bias)



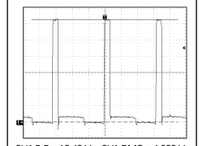
27 1.104 kV (Q402, Collector)



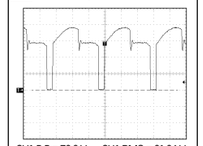
28 246 V (Q410, Collector)



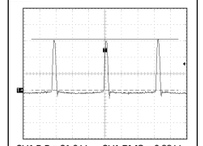
29 12.48 V (Q508, Gain)



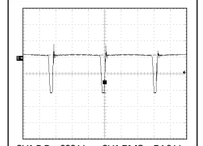
30 76.0 V (Q508, Drain)



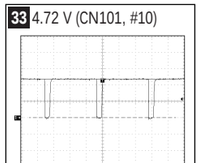
31 31.0 V (T501,



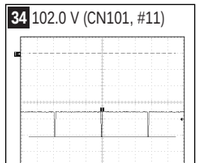
32 232 V (T501,



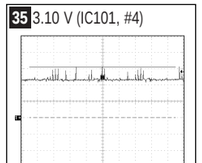
33 4.72 V (CN101, #10)



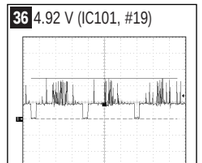
34 102.0 V (CN101, #11)



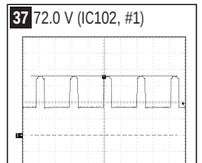
35 3.10 V (IC101, #4)



36 4.92 V (IC101, #19)



37 72.0 V (IC102, #1)



38 60.8 V (SK103, #1)

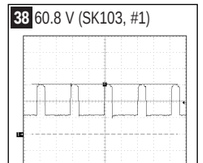


Table 11-1. IC101 (KA2141)

pin #	MODES		pin #	MODES	
	1024 x 768 / 60 Hz	640 x 480 / 60 Hz		1024 x 768 / 60 Hz	640 x 480 / 60 Hz
1	1.47	1.47	11	4.37	4.13
2	1.74	1.74	12	5.79	5.8
3	1.84	1.84	13	3.42	3.35
4	2.39	2.39	14	GND	GND
5	11.65	11.66	15	5.52	5.53
6	2.38	2.38	16	11.65	11.66
7	GND	GND	17	3.53	3.46
8	2.39	2.39	18	5.49	5.50
9	0.16 ~ 3.04	0.16~3.04	19	3.59	3.52
10	4.99	4.93	20	1.5 ~ 2.1	1.5 ~ 2.1

Unit: Vrms

Table 11-2. IC102 (LM2406)

pin #	MODES	
	1024 x 768 / 60 Hz	640 x 480 / 60 Hz
1	44.72	46V
2	GND	GND
3	43.83	45.09
4	GND	GND
5	44.60	46
6	75.66	72.77
7	GND	GND
8	3.42	3.35
9	3.53	3.47
10	11.66	11.66
11	3.59	3.52

Unit: Vrms

Table 11-3. IC201 (KIA7545)

pin #	MODES	
	1024 x 768 / 60 Hz	640 x 480 / 60 Hz
1	5.05	5.05
2	GND	GND
3	5.03	5.03

Unit: Vrms

Table 11-4. IC202 (68HC705)

pin #	MODES		pin #	MODES	
	1024 x 768 / 60 Hz	640 x 480 / 60 Hz		1024 x 768 / 60 Hz	640 x 480 / 60 Hz
1	0~5	0~5	21	–	–
2	0~5	0~5	22	–	–
3	0~5	0~5	23	5.05	5.05
4	5.03	5.03	24	5.05	5.05
5	5.05	5.05	25	3.82	3.82
6	–	–	26	3.68	3.68
7	GND	GND	27	–	–
8	2.46	2.46	28	5.05	5.05
9	2.08	2.08	29	5.03	5.03
10	5.03	5.03	30	5.02	5.02
11	5.03	5.03	31	5.02	5.02
12	–	–	32	5.03	5.03
13	–	–	33	–	–
14	–	–	34	–	–
15	–	–	35	–	–
16	4.94	4.94	36	–	–
17	–	–	37	4.98	4.98
18	–	–	38	–	–
19	–	–	39	–	–
20	–	–	40	5.03	5.03

Unit: Vrms

Table 11-5. IC203 (24LC04B)

pin #	MODES	
	1024 x 768 / 60 Hz	640 x 480 / 60 Hz
1	GND	GND
2	GND	GND
3	GND	GND
4	GND	GND
5	5.02	5.02
6	5.03	5.03
7	GND	GND
8	5.05	5.05

Unit: Vrms

Table 11-6. IC204 (24LC211/P)

pin #	MODES	
	1024 x 768 / 60 Hz	640 x 480 / 60 Hz
1	–	–
2	–	–
3	–	–
4	GND	GND
5	3.82	3.82
6	3.68	3.68
7	4.78	4.78
8	4.99	4.99

Unit: Vrms

Table 11-7. IC301 (TDA9302)

pin #	MODES	
	1024 x 768 / 60 Hz	640 x 480 / 60 Hz
1	1.09	1.09
2	12.98	12.98
3	10.90	10.90
4	10.99	10.99
5	5.5	5.5
6	12.92	12.92
7	1.09	1.09

Unit: Vrms

Table 11-8. IC302 (L2M2M)

pin #	MODES	
	1024 x 768 / 60 Hz	640 x 480 / 60 Hz
1	9.57	9.57
2	13.02	13.02
3	9.54	9.54
4	11.03	11.03
5	9.54	9.54
6	9.57	9.57
7	2.12	2.12
8	2.13	2.13

Unit: Vrms

Table 11-9. IC401 (TDA9109)

pin #	MODES		pin #	MODES	
	1024 x 768 / 60 Hz	640 x 480 / 60 Hz		1024 x 768 / 60 Hz	640 x 480 / 60 Hz
1	–	–	17	GND	GND
2	–	–	18	7.04	7.04
3	5.06	5.06	19	GND	GND
4	3.026	3.026	20	5.30	5.30
5	4.02	4.02	21	8.04	8.04
6	2.374	2.374	22	3.51	3.51
7	2.378	2.378	23	3.44	3.44
8	7.97	7.97	24	2.901	2.901
9	–	–	25	6.73	6.73
10	9.32	9.32	26	2.772	2.772
11	–	–	27	GND	GND
12	-0.5	-0.5	28	1.633	1.633
13	7.91	7.91	29	12.05	12.05
14	2.349	2.349	30	5.04	5.04
15	4.65	4.65	31	5.04	5.04
16	36.8mV	36.8mV	32	5.04	5.04

Unit: Vrms

Table 11-10. IC601 (TL431CLP)

pin #	MODES	
	1024 x 768 / 60 Hz	640 x 480 / 60 Hz
1	2.52	2.52
2	GND	GND
3	10.69	10.69

Unit: Vrms

Table 11-11. IC602 (KA2S0880)

pin #	MODES	
	1024 x 768 / 60 Hz	640 x 480 / 60 Hz
1	189.5	189.5
2	GND	GND
3	19.70	19.70
4	2.389	2.389
5	4.8	4.8

Unit: Vrms

Table 11-12. IC603 (7805)

pin #	MODES	
	1024 x 768 / 60 Hz	640 x 480 / 60 Hz
1	13.04	13.04
2	GND	GND
3	5.09	5.09

Unit: Vrms

Table 11-13. IC604 (78R12)

pin #	MODES	
	1024 x 768 / 60 Hz	640 x 480 / 60 Hz
1	12.97	12.97
2	12.11	12.11
3	GND	GND
4	9.22	9.22

Unit: Vrms